AL1515

Service Guide

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Conventions

The following conventions are used in this manual:

Screen messages	Denotes actual messages that appear on screen
Note	Gives bits and pieces of additional information related to the current topic.
Warning	Alerts you to any damage that might result from doing or not doing specific actions.
Caution	Gives precautionary measures to avoid possible hardware or software problems.
Important	Reminds you to do specific actions relevant to the accomplishment of procedures.

Preface

Before using this information and the product it supports, please read the following general information.

1. this Service Guide provides you with all technical information relating to the BASICCONFIGURATION decided for Acer's "global" product offering. To better fit local market requirements and enhance product competitiveness, your regional office MAY have decided to extend the functionality of a machine (e.g. add-on card, modem, or extra memory capability). These LOCALIZED FEATURES will NOT be covered in this generic service guide. In such cases, please contact your regional offices or the responsible personnel/channel to provide you with further technical details.
2. please not WHEN ORDERING FRU PARTS, that you should check the most up-to-date information available on your regional web or channel. If, for whatever reason, a part number change is made, it will not be noted in the printed Service Guide, for ACER-AUTHORIZED SERVICE PROVIDERS, your Acer office may have a DIFFERENT part number code to those given in the FRU list of this printed Service Guide. You MUST use the list provided by your regional Acer office to order FRU parts for repair and Service of customer machines.

WARNING: (FOR FCC CERTIFIED MODELS)

NOTE: this equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception,

Which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.
3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
4. Consult the dealer or an experienced radio/TV technician for help.

Warning

Use only shielded signal cables to connect I/O devices to this equipment. You are cautioned that changes or modifications not expressly approved by the party responsible for comliance could viold your authority to operate the equipment.

As an ENERGY STAR® Partner our company has determined that this product meets the ENERGY STAR® guidelines for energy efficiency.

WARNING:

To prevent fire or chock hazard, do not expose the monitor to rain or moisture. Dangerously high voltages are present inside the monitor. Do not open the cabinet. Refer servicing to qualified personnel only.

PRECAUTIONS

- Do not use the monitor near water, e.g. near a bathtub, washbowl, kitchen sink, laundry tub, Swimming pool or in a wet basement.

- Do not place the monitor on an unstable trolley, stand, or table. If the monitor falls, it can injure a person and cause serious damage to the appliance. Use only a trolley or stand recommended by the manufacture or sold with the monitor. If you mount the monitor on a wall or shelf, use a mounting kit approved by the manufacture and follow the kit instructions.
- Slots and openings in the back and bottom of the cabinet area provided for ventilation. To ensure reliable operation of the monitor and to protect it from overheating, be sure these openings are not blocked or covered. Do not place the monitor on a bed, sofa, rug or similar surface. Do not place the monitor near or over a radiator or heat register. Do not place the monitor in a bookcase or cabinet unless proper ventilation is provided.
- The monitor should be operated only from the type of power source indicated on the label. If you are not sure of the type of power supplied to your home, consult your dealer or local power company.
- The monitor is equipped with a three-pronged grounded plug, a plug with a third (grounding) pin. This plug will fit only into a grounded power outlet as a safety feature. If your outlet does not accommodate the three-wire plug, have an electrician install the correct outlet, or use an adapter to ground the appliance safely. Do not defeat the safety purpose of the grounded plug.
- Unplug the unit during a lightning storm or when it will not be used for long periods of time. This will protect the monitor from damage due to power surges.
- Do not overload power strips and extension cords. Overloading can result in fire or electric shock.
- Never push any object into the slot on the monitor cabinet. It could short circuit parts causing a fire or electric shock. Never spill liquids on the monitor.
- Do not attempt to service the monitor yourself; opening or removing covers can expose you to dangerous voltages and other hazards. Please refer all servicing to qualified service personnel.
- To ensure satisfactory operation, use the monitor only with UL listed computers which have appropriate configured receptacles marked between 100-240V AC, Min. 3.5A.
- The wall socket shall be installed near the equipment and shall be easily accessible.

SPECIAL NOTES ON LCD MONITORS

The following symptoms are normal with LCD monitor and do not indicate a problem.

NOTES

- Due to the nature of the fluorescent light, the screen may flicker during initial use. Turn off the Power Switch and then turn it on again to make sure the flicker disappears.
- You may find slightly uneven brightness in the screen depending on the desktop pattern you use.
- The LCD screen has effective pixels of 99.99% or more. It may include blemishes of 0.01% or less such as a missing pixel or a pixel lit all of the time.
- Due to the nature of the LCD screen, an afterimage of the previous screen may remain after switching the image, when the same image is displayed for hours. In this case, the screen is recovered slowly by changing the image or turning off the Power Switch for hours.

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Chapter 1

Monitor Feature

INTRODUCTION

Scope

This specification defines the requirements for the 15” high resolution color LCD monitor. This monitor can be directly connected to general 15 pin D-sub VGA connector and eliminates the requirement of optional special display card. It also supports VESA DPMS power management and plug & play function. There is a build-in stereo audio amplifier with volume control to drive a pair of speakers.

Description

The LCD monitor is designed with the latest LCD technology to provide a performance oriented product with no radiation. This will alleviate the growing health concerns. It is also a space saving design, allowing more desktop space, and comparing to the traditional CRT monitor, it consumes less power and gets less weight in addition MTBF target is 20k hours or more.

ELECTRICAL REQUIREMENTS

Standard Test Conditions

All tests shall be performed under the following conditions, unless otherwise specified.

Ambient light :	225 lux
Viewing distance :	50 cm in front of LCD panel
Warrn up time	
All specifications :	30 minutes
Fully functional :	5 seconds
Measuring Equipment :	Chroma 2250 signal generator or equivalent, directly
	Connected to the monitor under test.
	Minolta CA100 photometer, or equivalent
Control settings	
User brightness control :	Maximum (unless otherwise specified)
User contrast control:	Typical (unless otherwise specified)
User red/white balance,	
Green/white balance and	
Blue/white balance control :	In the center (unless otherwise specified)
Power input:	110Vac or 230Vac
Ambient temperature:	20 ± 5 ˚C (68 ± 9 ˚ F)
Analog input mode:	1024 x768 /60 Hz

MEASUREMENT SYSTEMS

The units of measure stated in this document are listed below:

1 gamma = 1 nano tesla

1 tesla = 10,000 gauss

cm = in x 2.54

lb = kg x 2.2

degrees F = [°C x 1.8] + 32

degrees C = [°F - 32]/1.8

u' = 4x/(-2x + 12y + 3)

v' = 9y/(-2x + 12y + 3)

x = (27u'/4)/[(9u'/2) - 12v' + 9]

y = (3v')/[(9u'/2) - 12v' + 9]

nits = cd/(m^2) = Ft-L x 3.426

lux = foot-candle x 10.76

LCD monitor General specification

Panel Type: 15 " active matrix color TFT LCD

LCD Panel

	Hannstar		LG
Type	**HSD150SX84**	**HSD150SX87**	**LM150X08**
Size	**15.0" (38cm)**	**15.0" (38cm)**	**15.0" (38cm)**
Display Type	**Active matrix color TFT LCD**	**Active matrix color TFT LCD**	**Active matrix color TFT LCD**
Resolution	**1024x768**	**1024x768**	**1024x768**
Display Dot	**1024x(RGB)X768**	**1024x(RGB)X768**	**1024x(RGB)X768**
Display color	**262K**	**262K**	**262K**
Brightness	**250 cd/m^2 (typical)**	**250 cd/m^2 (typical)**	**250 cd/m^2 (typical)**
Contrast Ratio	**400:1 (typical)**	**400:1 (typical)**	**400:1 (typical)**
Response Time	**35 ms (typicl)**	**35 ms (typicl)**	**35 ms (typicl)**
Lamp Voltage	**760 Vrms (typical)**	**860 Vrms (typical)**	**560 Vrms (typical)**
Lamp Current	**6.0 mA rms. (typical)**	**6.5 mA rms. (typical)**	**8 mA rms. (typical)**
Viewing Angle	**Vertical: -55°~+45° Horizontal: -65°~+65°**	**Vertical: -55°~+45° Horizontal: -65°~+65°**	**Vertical: -55°~+45° Horizontal: -65°~+65°**

Display size: 304mm (H) × 228mm(V)

Display mode: VGA 720 × 400 (70 Hz)

VGA 640 × 480 (60/66/70/72/75 Hz)

SVGA 800 × 600 (60/70/72/75 Hz)

XGA 1024 × 768 (60/70/75 Hz)

Pc interface: 1).Video: RGB analog 0.7V peak to peak

Sync: TTL positive or negative

Signal connector: 15 pin Mini D type, (standard VGA video)

3.5 mm stereo audio jack (Audio) (For AL1515 m only)

Audio power: 0.5Wrms + 0.5Wrms (300Hz – 10kHz (S.P.L. – 10 dB))(AL1515 m only)

Front control: power on/off with LED select adjustment (+,-)

Interface frequency

Horizontal Frequency 24KHz --61KHz

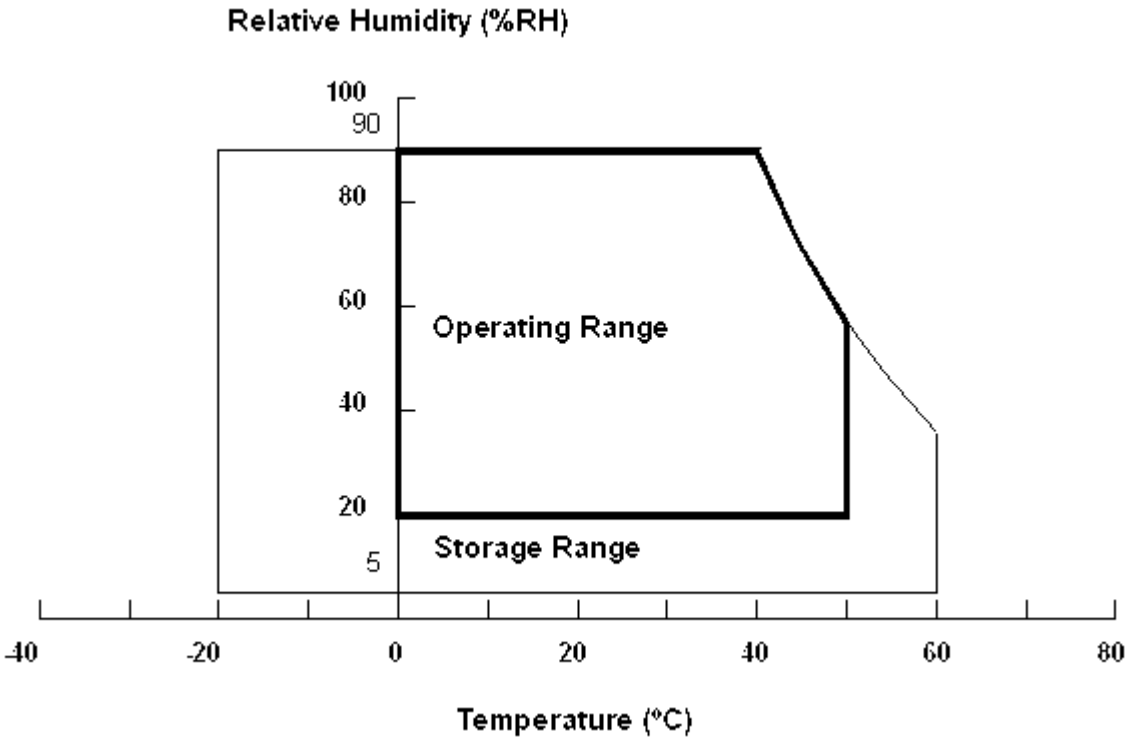
Vertical Frequency 56Hz ------75Hz

Plug & play: Support VESA DDC2B functions

Power Input voltage: Single phase, 50/60HZ, 100 VAC to 240VAC ±10%

Total output power: 60 Watt max.

Panel Relative Humidity



Input Signals

Video input

- Type — Analog R, G, B.
- Input Impedance — 75 ohm +/- 2%
- Polarity — Positive
- Amplitude — 0 - 0.7 +/- 0.05 Vp
- Display Color — same as LCD panel

Sync input

- Signal — separate horizontal and vertical sync, or composite sync which are TTL compatible
- Polarity — positive and negative.

Interface frequency

The following frequency range is generalized by supported timing. If the entered mode does not match the supported timing the display optimization will not be assured.

- Horizontal Frequency — 24KHz --61KHz
- Vertical Frequency — 56Hz -------75Hz

Supported Timing

TIMING	FH(KHZ) FV(HZ)	SYNC POLARITY	TOTAL (DOT/LINE)	ACTIVE (DOT/LINE)	SYNC WIDTH (DOT/LINE)	FRONT PORCH (DOT/LINE)	BACK PORCH (DOT/LINE)	PIXEL FOREQ.(MHZ)
640x350	31.469	+	800	640	96	16	48	25.175
VGA-350	70.087	–	449	350	2	37	60	
640x400	24.83	–	848	640	64	64	80	21.05
NEC PC9801	56.42	–	440	400	8	7	25	
640x400	31.469	–	800	640	96	16	48	25.175
VGA-GRAPH	70.087	+	449	400	2	12	35	
640x400	31.5	–	800	640	64	16	80	25.197
NEC PC9821	70.15	–	449	400	2	13	34	
640x480	31.469	–	800	640	96	16	48	25.175
VGA-480	59.94	–	525	480	2	10	33	
640x480	37.861	–	832	640	40	16	120	31.5
VESA-480-72Hz	72.809	–	520	480	3	1	20	
640x480	37.5	–	840	640	64	16	120	31.5
VESA-480-75Hz	75	–	500	480	3	1	16	
720x400	31.469	–	900	720	108	18	54	28.322
VGA-400-TEXT	70.087	+	449	400	2	12	35	
832x624	49.725	–	1152	832	64	32	224	57.2832
APPLE MAC-800	74.55	–	667	624	3	1	39	
800x600	35.156	+	1024	800	72	24	128	36
SVGA	56.25	+	625	600	2	1	22	
800x600	37.879	+	1056	800	128	40	88	40
VESA-600-60Hz	60.317	+	628	600	4	1	23	
800x600	48.077	+	1040	800	120	56	64	50
VESA-600-72Hz	72.188	+	666	600	6	37	23	
800x600	46.875	+	1056	800	80	16	160	49.5
VESA-600-75Hz	75	+	625	600	3	1	21	
1024x768	48.363	–	1344	1024	136	24	160	65
XGA	60.004	–	806	768	6	3	29	
1024x768	53.964	+	1328	1024	176	16	112	71.664
COMPAQ-XGA	66.132	+	816	768	4	8	36	
1024x768	56.476	–	1328	1024	136	24	144	75
VESA-768-70Hz	70.069	–	806	768	6	3	29	
1024x768	60.023	+	1312	1024	96	16	176	78.75
VESA-768-75Hz	75.029	+	800	768	3	1	28	
1024x768	60.24	–	1328	1024	96	32	176	80
APPLE MAC-768	75.02	–	803	768	3	3	29	

Note: Mode 640x350, 640x400 and 720x400 will locate on middle position but cannot be expanded to full screen on vertical direction.

Support Modes

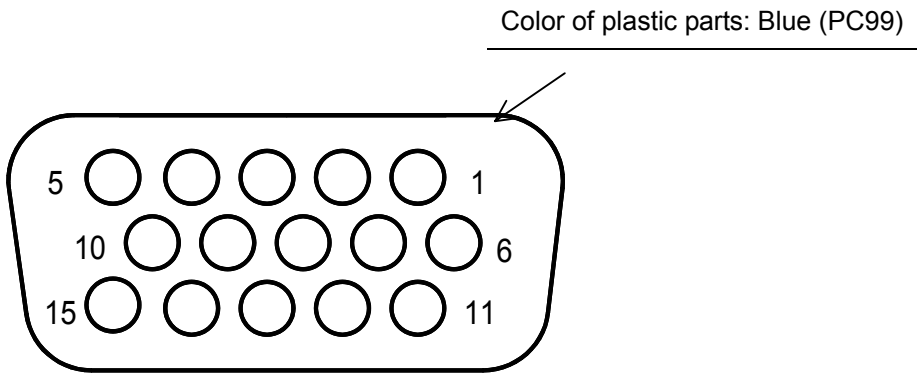
There will be 28 total support modes to accommodate the above mode and other video modes within the frequency range of the monitor.

Video input Connector

Analog Video input Connector: 15pins mini D-Sub

Table 2.4.5. Pin assignment for D-sub connector

PIN NO.	Separate Sync
1	RED VIDEO
2	GREEN VIDEO
3	BLUE VIDEO
4	GROUND
5	GROUND
6	RED GROUND
7	GREEN GROUND
8	BLUE GROUND
9	PC5V (+5V DDC)
10	CABLE DETECTION
11	GROUND
12	SDA
13	H.SYNC
14	V.SYNC
15	SCL



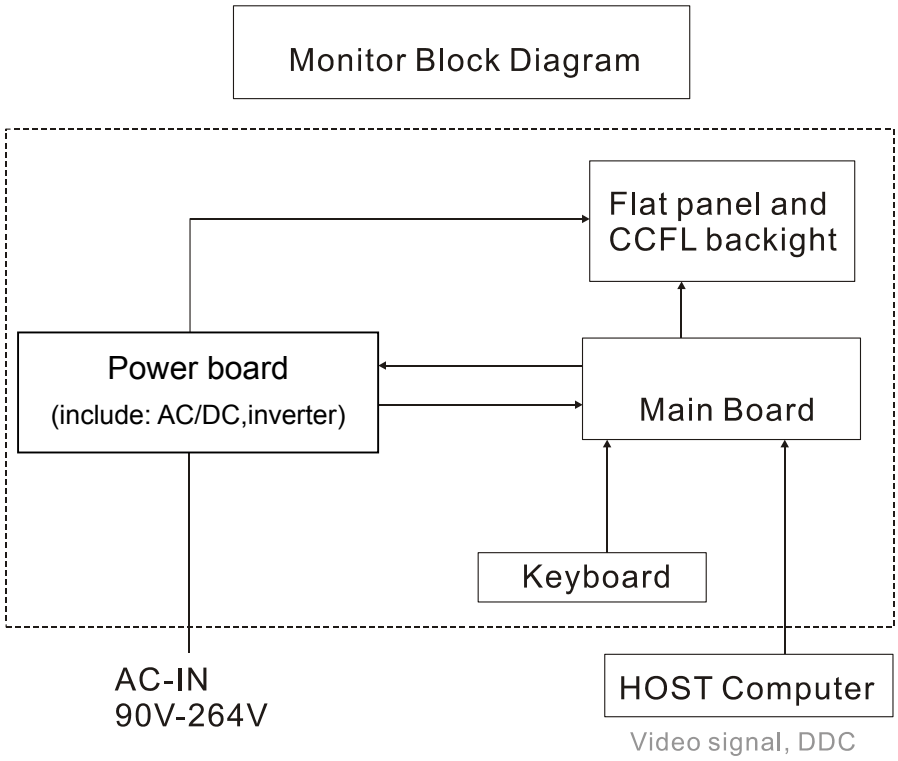
D-sub connector

MONITOR BLOCK DIAGRAM

The LCD monitor will contain an main board, an inverter/ power board, key board and internal adapter which house the flat panel control logic, brightness control logic and DDC.

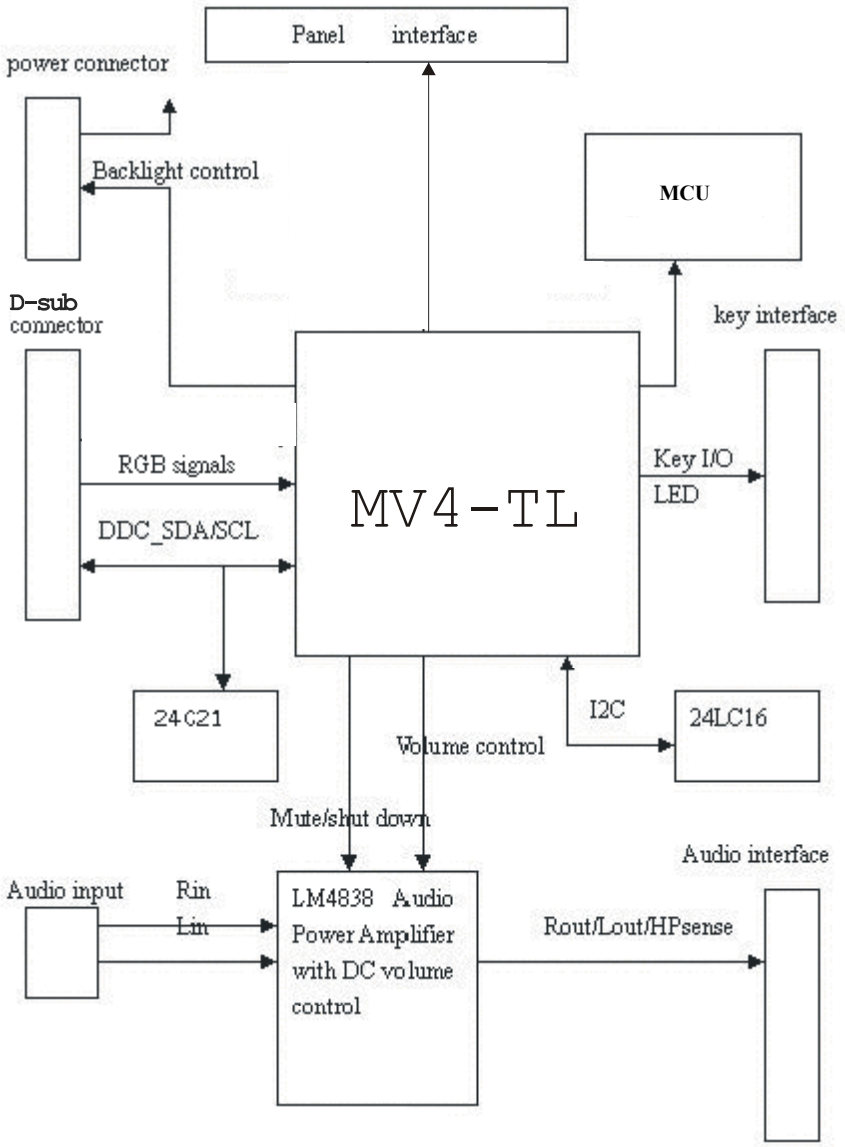
The inverter board will drive the backlight of panel and the DC-DC conversion.

The Adapter will provide thr 12V DC-power to inverter/ power board.

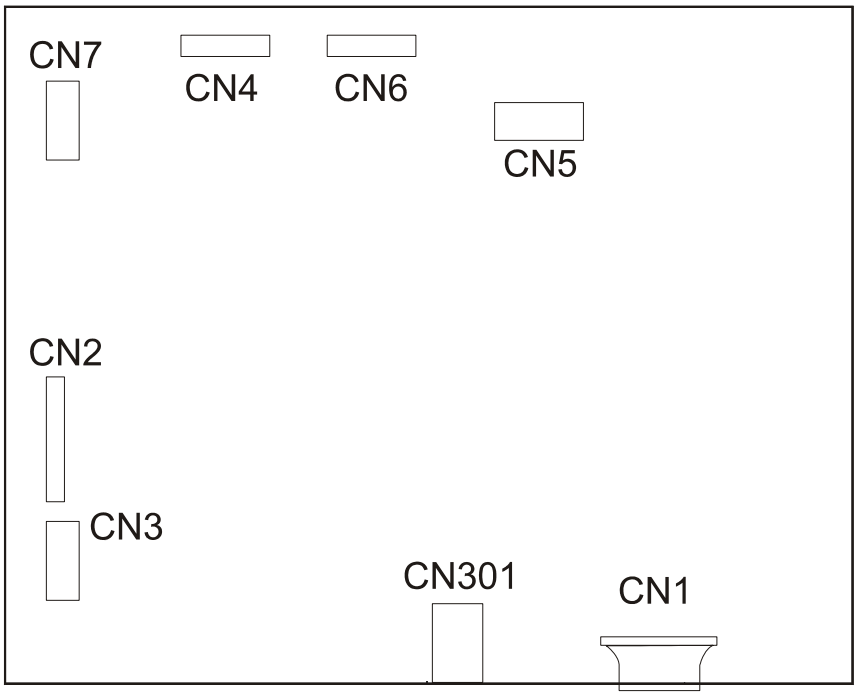


BLOCK DIAGRAM

System Block Diagram

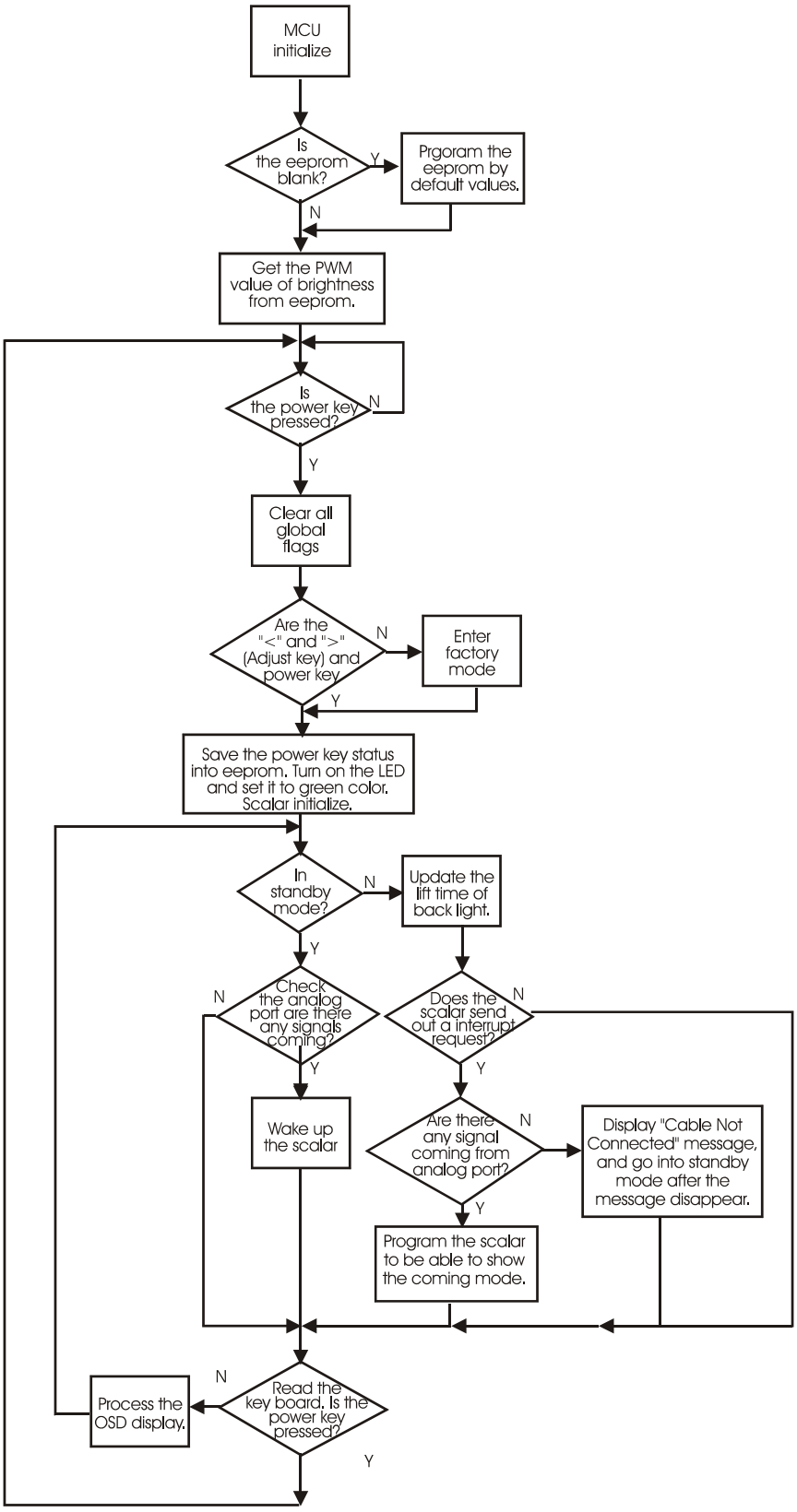


Monitor board layout



LABEL	Component	LABEL	Component
U1	24LC21	CN1	D-SVB 15 PIN
U2	MV4-TL	2	4300-13
U3	MX810TR		
U4	MX10E8050IQC	4 & CN6	P-TWO AF740B40P
U5	24LC16B	5	E & T 3950-20
U7	AIC 1084		
U8	APL1117	CN7	E & T 4500-06
U301	LM4838	CN301	SC SCJ368R1NXS0U04
		CN300	E & T 4500-02

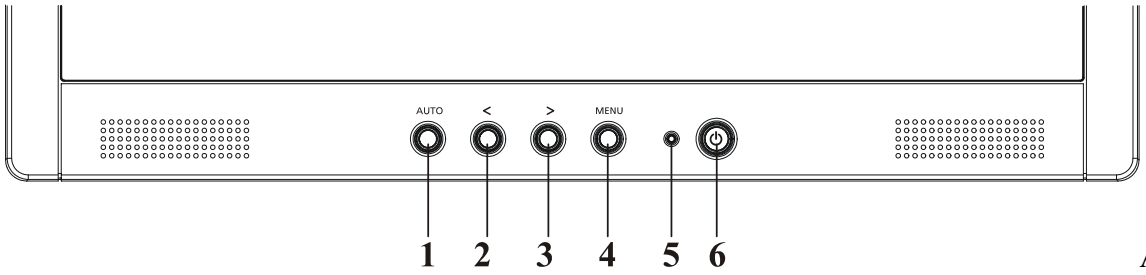
Software flow chart


MCU initialize
Is the eeprom blank?
Y
Prgoram the eeprom by default values.
N
Get the PWM value of brightness from eeprom.
Is the power key pressed?
N
Y
Clear all global flags
Are the "<" and ">" (Adjust key) and power key
N
Enter factory mode
Y
Save the power key status into eeprom. Turn on the LED and set it to green color. Scalar initialize.
In standby mode?
N
Update the lift time of back light.
Y
Check the analog port are there any signals coming?
N
Does the scalar send out a interrupt request?
N
Y
Y
Wake up the scalar
Are there any signal coming from analog port?
N
Display "Cable Not Connected" message, and go into standby mode after the message disappear.
Y
Program the scalar to be able to show the coming mode.
N
Read the key board. Is the power key pressed?
Process the OSD display.
Y

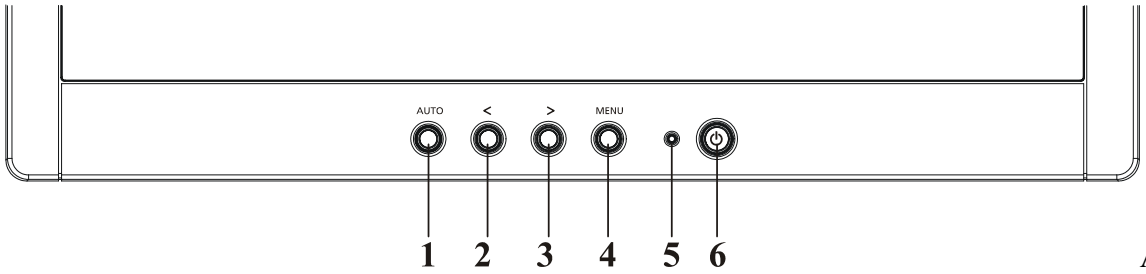
General Instructions

Press the power button to turn the monitor on or off. The other control buttons are located at front panel of the monitor. By changing these settings, the picture can be adjusted to your personal preferences.

- The power cord should be connected.
- Connect the video cable from the monitor to the video card.
- Press the power button to turn on the monitor position. The power indicator will light up.



AL1515 m

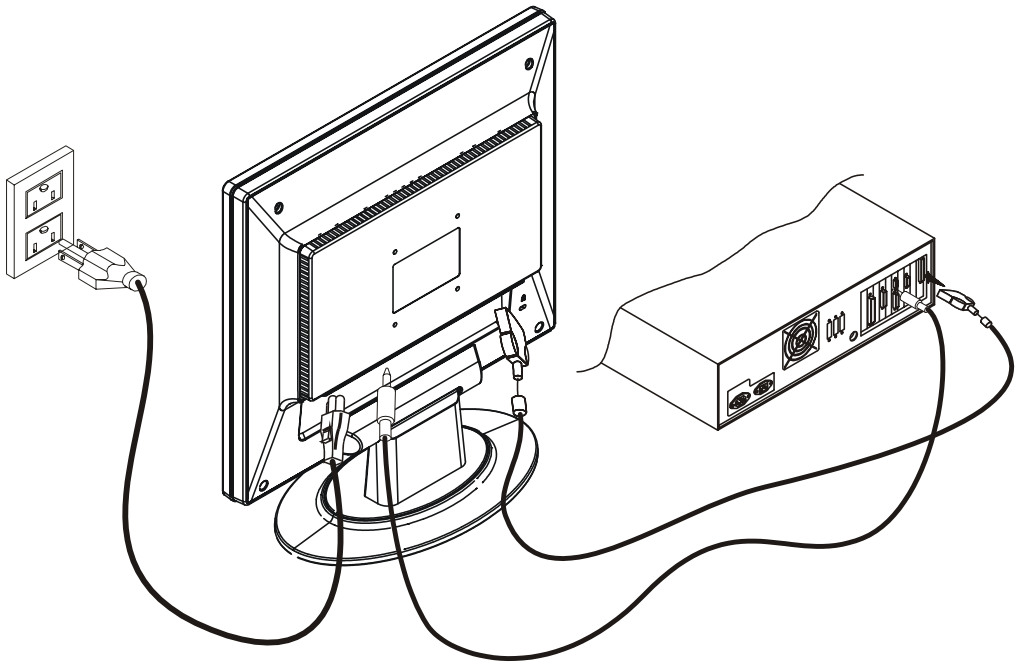


AL1515

External Controls

1	Auto Adjust Key/Exit	4	MENU/ENTER
2	</ Volume	5	LED
3	>/ Volume	6	⏻ / Power Key

System Installation



Connecting the Display

- Power off your computer.
- Connect one end of the signal cable to the LCD Monitor’s VGA port.
- Connect the other end of the signal cable to the VGA port on your PC.
- Make sure connections are secure.

Connecting the AC Power

- Connect the power cord to the LCD Monitor.
- Connect the power cord to an AC power source.

Connecting the Audio Cable (For AL1515 m and AL1515 bm)

- Connect the audio cable to the " LINE OUT " jack on your PC's audio card or to the front panel's “AUDIO OUT” jack of your CD ROM drive.
- Connect the other end of the audio cable to the LCD Monitor's " AUDIO IN " jack.

The step between front bezel and back cover shall be within specification.

Top and Bottom

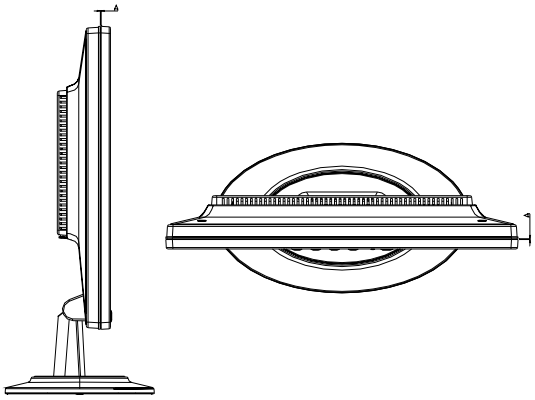
Back cover & Bezel concavity

0.8mm ≤ A ≤ 1.3 mm

Left and Right

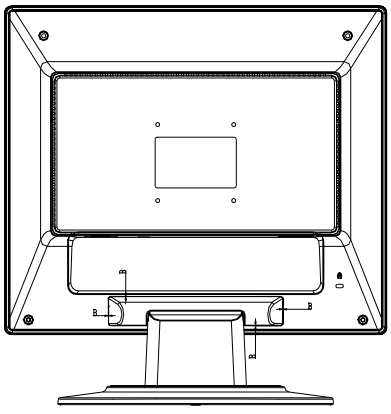
Back cover & Bezel concavity

0.8mm ≤ A ≤ 1.3 mm



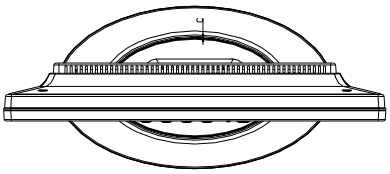
Back Cover & Hinge Cover concavity

0mm ≤ B ≤ 0.5mm



Base & Neck concavity

0mm ≤ C ≤ 0.6mm



Top and Bottom

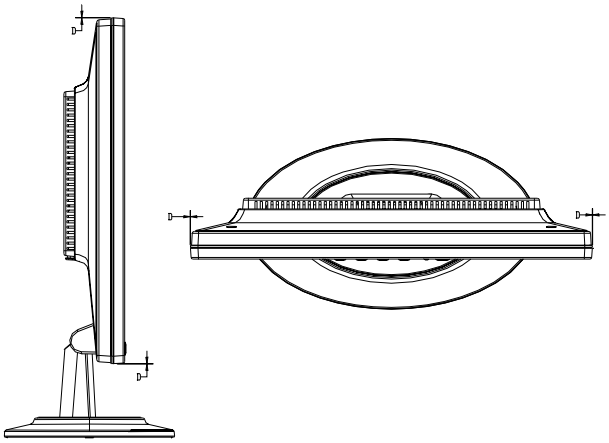
Back cover & Bezel step

0mm ≤ D ≤ 0.8 mm

Left and Right

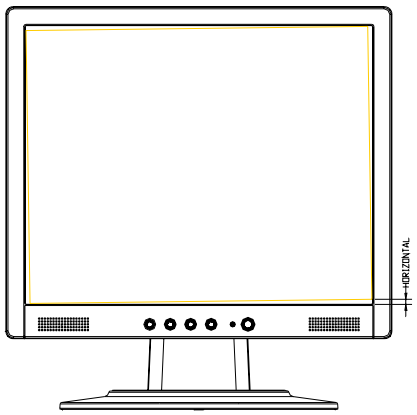
Back cover & Bezel step

0mm ≤ D ≤ 0.8 mm

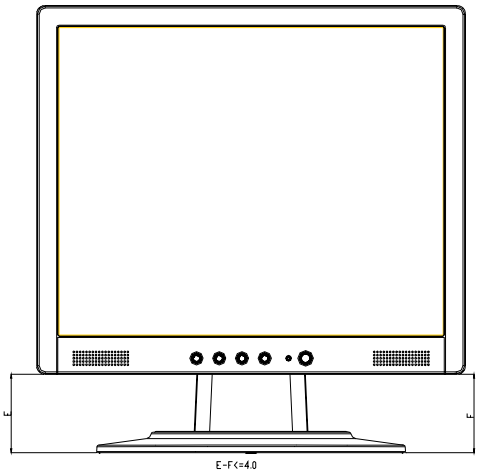


LCD Horizontally

The angle between front bezel and LCD unit in bottom side should not large than 1.0mm.



The distance of the LCD display unit from left side to right should not large than 4.0mm.



Tilt Base Rotation

Tilt up 15 ± 2°/ down 5 ±2°

Plastic Material

For TCO99

Front Bezel PC+ABS

Back Cover PC+ABS

The Others ABS 94HB

For MPRII

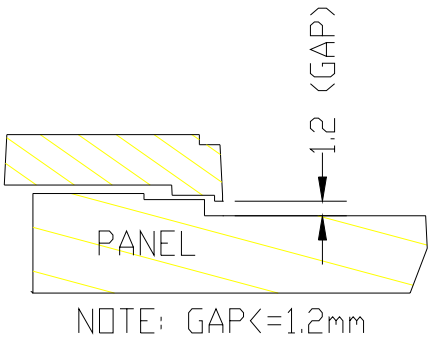
Front Bezel ABS 94V-0

Back Cover ABS 94V-0

The Others ABS 94HB

GAP Spec.

Gap between panel with bezel is 0 mm < gap < 1.2 mm



POWER BOARD

Description

This specification defined the performance and characteristic for the VP-589 power board. It supplies the following items.

1). A constant 5V output source for logic board.

2). A constant 5V output source for audio's power source.

3). A constant 12V output source for Inverter's power souce

Features

Wide input range: AC input 90Vrms~264Vrms

Input Frequency: 47 ~ 63Hz

Inverter brightness adjustment: Burst mode

Protection function: auto-recovery type, It includes OPP, SCP.

Interface Signals

Input

1. AC Inlet: HUAJIE SA-4S-066 or compatible.

Output Connector & Pin Assignment:

1. The connecter was pitch 2.0mm, cable length was 125mm.

PIN NO.	Function	Function
1	+5V	+5V supply for logic board
2	+5V	+5V supply for logic board
3	GND	Ground
4	GND	Ground
5	VEN	Enable signal for inverter (Low active, <1V)
6	VBRI	Brightness signal for inverter (0.5V to 3.2V)
7	- -	
8	+5V	+5V supply for audio's power (For AL1515 only)
9	GND	Audio ground (For AL1515 only)

J901, J902: Inverter High voltage output

PIN NO.	Function	Comment
1	LV	Low voltage (common)
2	HV	High voltage for lamp

Electrical Specification:

AC-DC Electrical specification

Input Specification

No	Item	Condition	Min.	Typ.	Max.	Unit
1	Input Voltage	-----	100	---	240	Vac
2	Input Frequency	-----	47	---	63	Hz
3	Input Current	100Vac@ Type load 1.5A	---	---	1.0	Arms
4	Inrush Current	Cold Start @Vin=100Vrms	---	---	30	A_{0-P}
		Cold Start @Vin=220Vrms		---	50	A_{0-P}
5	Hold Up Time	@full load & 100Vac input and Type load	10	---	---	ms
6	Turn on time	Vin =110Vac	---	1.0	---	S
7	Efficiency	+12V/1.05A, +5Vcc/1.5A	70	---	---	%
8	Input Power Consumption	Vin=220Vac	---	---	1.2	W

***Cold start up of Inrush Current: Power board off (keep over 1 hour) and Ta=25 degree C**

AC-DC Output Specification

	Tolerance	Output Current		Voltage Tolerance
Output Voltage	---	MIN	MAX	
+5Vdc	+5 /-3 %	0.05A	1.5A	4.85~5.25V dc
+12Vdc	+25/-5 %	0A	1.5A	11.4~15Vdc
Ripple	1.Measured at DC output terminals which are paralleled with a 10uf Ecap &0.1uf Ceramic cap. 2.Band width is limited within 20MHz.	---	1%	+5Vdc:50mVp-p +12Vinv:120mVp-p
Noise		---	3%	+5Vdc:150mVp-p +12Vinv:360mVp-p
Dynamic Load Regulation	50~100% or 100~50% load change of any DC output @50% duty of 1MHz (min.)	---	±5%	---
Over / Under Shoot	@ Power line on/off	---	±5%	

*+5Vdc load regulation test: the +12Vinv loading at 1.0A

*+12Vinv load regulation test: the +5Vdc loading at 1.0A

Protection function

Auto-recovery design is acceptable, but input power must be less than 5W

1) SCP: Short circuit protection must be acted on both outputs

2) OPP: Should be protected when output power consumption is within 40W ~ 70W

Inverter Electrical Specification:

For Hannstar HSD 150SX84-D

	Condition	Min.	Typ.	Max.	Unit
Input Voltage	---	---	12	---	V
Input Current	---	---	1.0	---	A
Backlight ON/OFF Control	ON		0	1.0	V
	OFF	2.0	3.0	---	V
Brightness Adjust (Lamp Current Control)	Min. Luminance / Max. Luminance	---	55%	---	---
Output Voltage	Vin=12, Iout=6.5mA	---	750	---	Vrms
Brightness	HSD150SX84-B	200	250	---	Cd/m²
	HSD150SX84-D	175	200	---	
Output Current(Each connector)	Vbri=0.5~3.2V	3	6.5	7	mA
Frequency	---	40	50	70	KHz
Open Lamp Voltage	---	1350	---	---	Vrms
Striking Time	---	---	1.0	---	S
Lamp Current Balance	---	---	±0.3	---	mA
Efficiency	Vin=12V	---	80	---	%
Operating Life Time	---	30000	---	---	Hr

*.The open lamp voltage is testes at output connector terminal

* Life time(Hr) can be defined as the time in which it continues to operate under the condition:

Ta=25±3°C, I_L=6.0Ma(ms) and f_L=30 KHz until one of the following event occurs:

1. When the brightness becomes 50%
2. When the startup voltage (Vs) at 0°C becomes higher than the maximal value of Vs specified above.

For Hannstar HSD 150SX87-

	Condition	Min.	Typ.	Max.	Unit
Input Voltage	---	---	12	---	V
Input Current	---	---	1.0	---	A
Backlight ON/OFF Control	ON		0	1.0	V
	OFF	2.0	3.0	---	V
Brightness Adjust (Lamp Current Control)	Min. Luminance / Max. Luminance	---	55%	---	---
Output Voltage	Vin=12, Iout=6.5mA	---	750	---	Vrms
Brightness	HSD150SX84-B	200	250	---	Cd/m²
	HSD150SX84-D	175	200	---	
Output Current(Each connector)	Vbri=0.5~3.2V	4	8	9	mA
Frequency	---	40	50	70	KHz
Open Lamp Voltage	---	1350	---	---	Vrms
Striking Time	---	---	1.0	---	S
Lamp Current Balance	---	---	±0.3	---	mA
Efficiency	Vin=12V	---	80	---	%
Operating Life Time	---	30000	---	---	Hr

*.The open lamp voltage is testes at output connector terminal

* Life time(Hr) can be defined as the time in which it continues to operate under the condition:

Ta=25±3°C, I_L=8.0Ma(ms) and f_L=30 KHz until one of the following event occurs:

1. When the brightness becomes 50%
2. When the startup voltage (Vs) at 0°C becomes higher than the maximal value of Vs specified above.

For Hannstar HSD 150SX84-A4

	Condition	Min.	Typ.	Max.	Unit
Input Voltage	---	---	12	---	V
Input Current	---	---	1.0	---	A
Backlight ON/OFF Control	ON		0	1.0	V
	OFF	2.0	3.0	---	V
Brightness Adjust (Lamp Current Control)	Min. Luminance / Max. Luminance	---	55%	---	---
Output Voltage	Vin=12, Iout=6.5mA	---	650	---	Vrms
Brightness	HSD150SX84-B	200	250	---	Cd/m²
	HSD150SX84-D	175	200	---	
Output Current(Each connector)	Vbri=0.5~3.2V	3	6.5	7	mA
Frequency	---	45	60	80	KHz
Open Lamp Voltage	at 0 °C	1100	---	---	Vrms
Striking Time	---	---	1.0	---	S
Lamp Current Balance	---	---	±0.3	---	mA
Efficiency	Vin=12V	---	80	---	%
Operating Life Time	---	40000	---	---	Hr

*.The open lamp voltage is testes at output connector terminal

* Life time(Hr)

1. Specified values are for a single lamp. When the brightness becomes 50%
2. The life is determined as the time at which brightness of the lamp is 50% compared to that of initial value at the typical lamp current on condition of continuous operating at 25±2°C.

SAFETY

Leakage Current: 0.25mA @ 100Vac

Insulation Resistance: more than 3M ohms while withstanding a voltage of 500Vac

Hi-Pot: 3Kvac with using 3mA cut off current

Power Consumption

The monitor is equipped with a power-management according to the below.

There is a delay of 5s … 7s before the transition from On-state to any power saving state to avoid unintentionally entering of a power saving stage during display resolution and timing mode changes.

Transition from any power saving state to another can be instantaneous.

The recovery from Off-state requires no manual power on.

Mode	H-Sync.	V-Sync.	Video	Pw-cons.	Indicator	Rec. time*
Power-On	on	on	active	< 60W	Green LED	--
Power-off	off	off	blanked	< 3 W	Orange LED	< 5S
Switch-off				< 3 W	Dark LED	

SYNC. On means: Normal operation

SYNC. Off means: H sync. F < 10KHz duty cycle > 25%

V sync. F < 10Hz duty cycle > 25%

CONNECTORS / CONTROLS

Connectors

- Power : Monitor rear side : AC Inlet
- Analog RGB : Monitor rear side / Data Cable : 15-pin D-sub female / male

Pin – Assignment of 15-pin D-sub:

1	Red Video	9	+5V FOR DDC
2	Green Video	10	Detect
3	Blue Video	11	Serial Data for ISP
4	Serial Clock for ISP	12	Serial Data for DDC
5	Ground	13	H-Sync.
6	Red Ground	14	V-Sync.
7	Green Ground	15	Serial Clock for DDC
8	Blue Ground		

- Audio : Monitor rear side :
  -PC I/P for PC : 3.5mm Stereo female

Monitor Control Keys

KEY : Power , Menu , Adjust +/- , Vol +/-, Auto

Position Of Controls

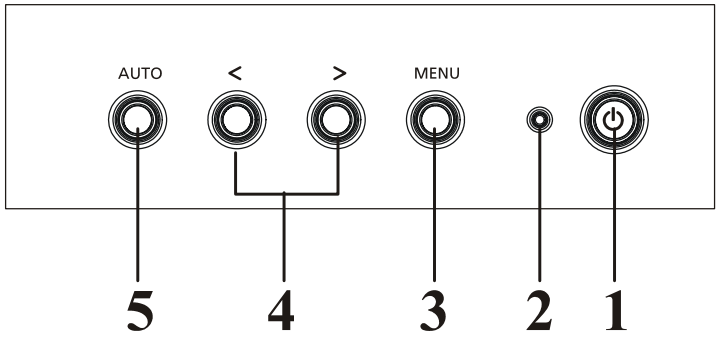
Position of all switches : Bottom side of front bezel

Position of LED : Bottom side of front bezel

Chapter 2

Operating Instructions

CONTROLS



Control panel (monitor front panel)

1. Power ON/OFF switch, push to ON and push to OFF. (Toggle switch)
2. Power LED will be blue when monitor is on; be amber when in power saving mode.
3. Menu.
4. Adjust increase (Function select).

   Adjust decrease (Function select).
5. Auto adjustment Buttons.

Note:

1. Press button 4 (plus +) or (minus -) at the same time can activate “Volume Adjustment”.

2. When OSD Menu is off, press button 5 (auto) at the same time can activate “Auto Adjustment” immediately.

3. When into Factory mode press 4 (plus +),(minus -) and 1 (power) together 2 seconds at same time.

5. When into Burning mode press 5 (menus), 1 (power) together 2 second at same time.

Main OSD Menu:

Outline:

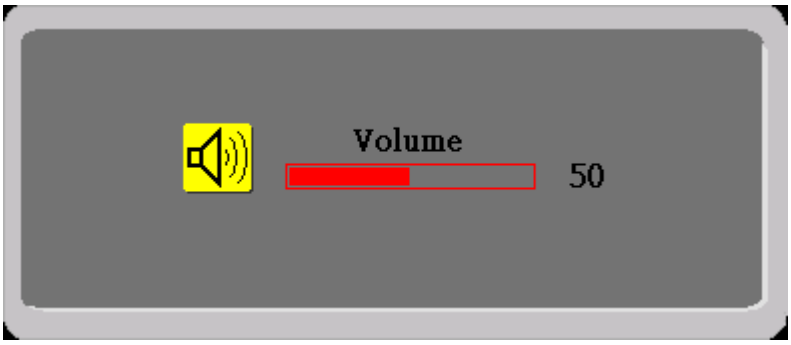
The description for control function :

Main Menu Icon	Sub Menu Item	Sub Menu Icon	Description	Adjustment Range	Reset Value
	Contrast		Contrast from Digital-register.	0-100	Recall Cool Contrast Value
	Brightness		Backlight Adjustment	0-100	Recall Cool Brightness Value
	Focus		Adjust Picture Phase to reduce Horizontal-Line noise	0-100	Do Auto Config
	Clock		Adjust picture Clock to reduce Vertical-Line noise.	0-100	Do Auto Config
	H. Position		Adjust the horizontal position of the picture.	0-100	Do Auto Config
	V. Position		Adjust the verticalposition of the picture.	0-100	Do Auto Config
	Warm	N/A	Recall Warm Color Temperature from EEPROM.	N/A	The Color Temperature will be set to Cool.
	Cool	N/A	Recall Cool Color Temperature from EEPROM.	N/A	

	User / Red		Red Gain from Digital-register.	0-100	100
	User / Green		Green Gain Digital-register.	0-100	100
	User / Blue		Blue Gain from Digital-register.	0-100	100
	English	N/A	Set OSD display language to English.	N/A	The Language will be set to English.
	繁體中文	N/A	Set OSD display language to Tranditional Chinese.	N/A	
	Deutsch	N/A	Set OSD display language to German.	N/A	
	Français	N/A	Set OSD display language to French.	N/A	
	Español	N/A	Set OSD display language to Spain.	N/A	
	Italiano	N/A	Set OSD display language to Italian.	N/A	
	简体中文	N/A	Set OSD display language to Simplified Chinese.	N/A	
	日本語	N/A	Set OSD display language to Japanese.	N/A	
	H. Position		Adjust the horizontal position of the OSD.	0-100	50
	V. Position		Adjust the verticalposition of the OSD.	0-100	50
	OSD Timeout		Adjust the OSD timeout.	10-120	10
	Auto Config	N/A	Auto Adjust the H/V Position, Focus and Clock of picture.	N/A	N/A
	Information	N/A	Show the resolution, H/V frequency and input port of current iput timing.	N/A	N/A
	Reset	N/A	Clear each old status of Auto-configuration and set the color temperature to Cool.	N/A	N/A
	Exit	N/A	Exit OSD	N/A	N/A

Hot-Key Menu:(For AL1515 m only)

Outline:



The description for Hot-Key function :

Item	Operation	Icon	Description	Adjustment Range	Reset Value
Volume	When the OSD is closed, press Left or Right button will be Volume Hot-Key Function		Volume of Audio adjustment. The Audio will be Mute when volume=0.	0-100	50

OSD Message:

Outline:

The description for OSD Message :

Item	Description
Auto Config Please Wait	When User Press Hot-Key “Auto”, will show this message, and the monitor do the auto config function.
Input Not Supported	When the Hsync Frequency, Vsync Frequency or Resolution is out of the monitor support range, will show this message. This message will be flying.
Cable Not Connected	When the video cable is not connected, will show this message. This message will be flying.
No Signal	When the video cable is connected, but the is no active signal input, will show this message, then enter power saving.

LOGO:

When the monitor is power on, the LOGO will be showed in the center.

Item of Factory menu

Vendor may customize design and add adjustment items Factory menu as far as all required items are included.

1) Bright

Adjust Brightness and Contrast value to Max.

2) Auto Balance

Adjust each R, G, B contrast (gain) and offset.

Method of auto adjust is depends on hardware.

Adjusted value of R, G, B gain shall be used for initial value of Contrast in user menu.

All value shall be adjustable manually.

This function shall be located in 3. tag of Factory menu.

3) Factory color temp data edit

Following data for color temp shall be editable manually.

-color temp default preset No.

Plug and play

Plug & play DDC2B feature

This monitor is equipped with VESA DDC2B capabilities according to the VESA DDC STANDARD. It allows the monitor to inform the host system of its identity and, depending on the level of DDC used, communicate additional information about its display capabilities. The communication channel is defined in two levels, DDC2B.
The DDC2Bis a bidirectional data channel based on the I^2C protocol. The host can request EDID information over the DDC2B channel.

THIS MONITOR WILL APPEAR TO BE NON-FUNCTIONAL IF THERE IS NO VIDEO INPUT SIGNAL. IN ORDER FOR THIS MONITOR TO OPERATE PROPERLY, THERE MUST BE A VIDEO INPUT SIGNAL.

This monitor meets the Green monitor standards as set by the Video Electronics Standards Association(VESA) and/or the United States Environmental Protection Agency (EPA) and The Swedish Confederation Employees (NUTEK). This feature is designed to conserve electrical energy by reducing power consumption when there is no video-input signal present. When there is no video input signal this monitor, following a time-out period, will automatically switch to an OFF mode. This reduces the monitor's internal power supply consumption. After the video input signal is restored, full power is restored and the display is automatically redrawn. The appearance is similar to a "Screen Saver" feature except the display is completely off. The display is restored by pressing a key on the keyboard, or clicking the mouse.

Using The Right Power Cord

The accessory power cord for the Northern American region is the wallet plug with NEMA 5-15 style and is UL listed and CSA labeled. The voltage rating for the power cord shall be 125 volt AC.
Supplied with units intended for connection to power outlet of personal computer: Please use a cord set consisting of a minimum No. 18 AWG, type SJT or SVT three conductors flexible cord. One end terminates with a grounding type attachment plug, rated 10A, 250V,CEE-22 male configuration. The other end terminates with a molded-on type connector body, rated 10A, 250V, having standard CEE-22 female configuration.
Please note that power supply card needs to use VDE 0602, 0625, 0821 approval power cord in European counties.

White Color Temperature

White color temperature is 4 preset as 9300, 7500,6500 and User,

Default value of user color should be user which is maximum setting for panel.

Target of color setting

Color Temp.	Color Coordinate		Tolerance	Color Coordinate		Tolerance
	x	y		u'	v'	
9300K	0.283	0.297	±0.03	0.189	0.446	u'v' ≤ 0.01*
6500K	0.313	0.329	±0.03	0.198	0.469	u'v' ≤ 0.01*
User	-	-		-	-	-

*) TCO'0X A.2.6.1 requirement

User should follow "Microsoft Windows Color Quality Specification for Liquid Crystal Display OEM's".

(http://www.microsoft.com/hwdev/tech/color/ColorTest.asp)

Audio Technical specification (For AL1515 m only)

General Description:

Output power	:	1W + 1W maximum
Total harmonic distortion	:	Less than 1 % (except speakers distortion)
Input signal sensitivity	:	0.5 Vrms for full output
Input impedance	:	47 Kohm +/- 5 %
Frequency response range	:	20Hz – 20kHz (except speakers response)
Difference of L and R output	:	Less than 2 dB

Electrical characteristics (Tamb=25°)

Audio amplifier(USE Panasonic VP-7723A Audio Analyzor.)

Item	Audio Input	Freq.	Spec.			Comment
			Min.	Typ.	Max.	
Input Voltage(V)			-	0.5Vms	-	
Input Current(m A)			-	500	800	
Audio Voltage Gain	500m Vrms	1KHz	-	-	6 d B	Volume Max.,load 4 Ω
Frequency Response	500m Vrms	300Hz-20KHz	-10dB	-	+10d B	Volume Max.,load 4 Ω
Signal to Noise ratio	500m Vrms	1KHz	-	-	-40dB	Volume Max.,load 4 Ω
Total harmonic distortion	500m Vrms	1KHz			1%	except speakers distortion
Cross talk	500m Vrms	1KHz	-	-	-30dB	Volume Max.,load 4 Ω
Output Watt.	500m Vrms	1KHz	-	-	0.5W	Volume Max.,load 4 Ω
Volume Control			-	-	-	Analog

Speakers

Maximum power	:	2 W per speaker(max)
Impedance	:	4 ohm +/- 15 % @ 1kHz 1.0Hz
Frequency response range	:	300 Hz – 20 kHz (S.P.L. – 10 dB)
Total harmonic distortion	:	Less than 5 % @ 0.125 W 1kHz

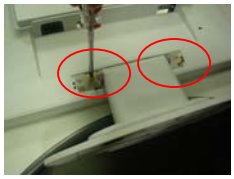
Chapter 3

Machine Disassembly and Replacement

Disassembly Procedure

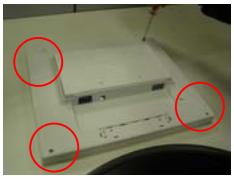
Disassemble the base

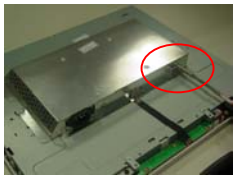
1. Remove the neck cover.
2. Remove the four screws to release the hinge.
3. Remove the base

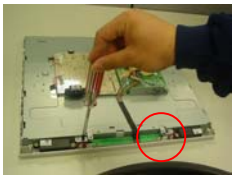


Disassemble the chassis

1. Remove the four screws to release the back cover.
2. Remove the two screws to release the EMI cover from chassis.
3. Remove the two screws from VGA connector.
4. Then take the chassis.
5. Remove the two screws from bezel.
6. To separate the chassis and bezel.
7. Remove the four screws from chassis and release the panel.

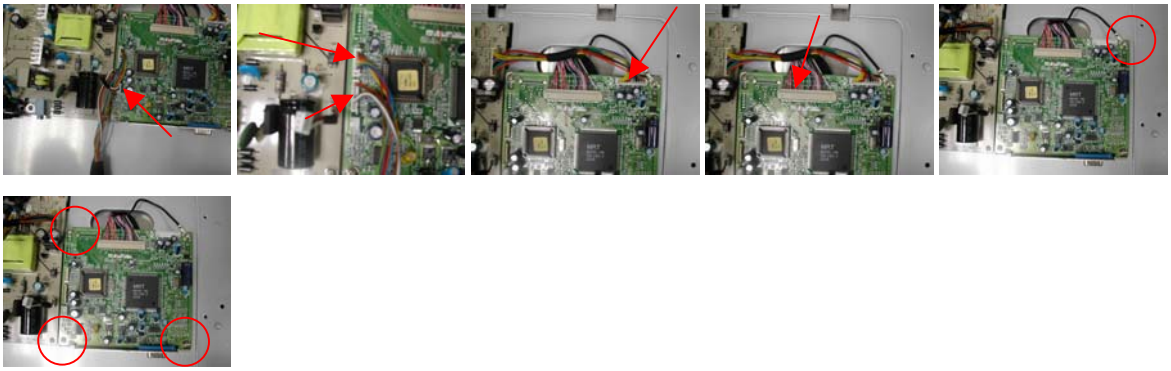






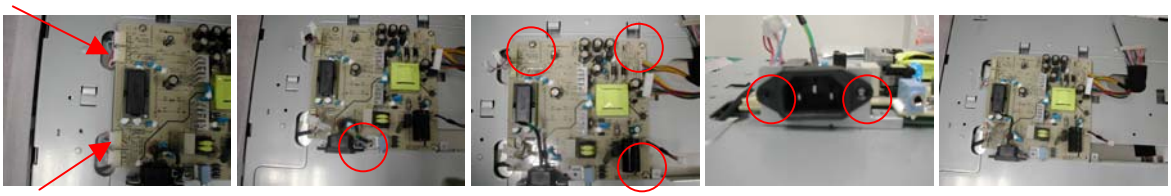
Disassemble the main board

1. Disassemble audio line from power board.
2. Disassemble two VL-VK lines from VL board.
3. Disassemble power line from VL board.
4. Disassemble FPC line from VL board.
5. Remove the one screw to release line from Chassis.
6. Remove the three screws from Chassis and release the main board.



Disassemble the power board

1. Disassemble two voltage lines from power board.
2. Remove the one screw to release line from Chassis.
3. Remove the three screws from Chassis.
4. Remove the two screws to release power board from Chassis.
5. Then take the power board from the chassia.

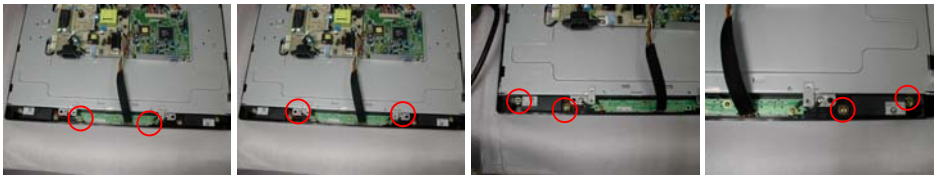


Disassemble the key board

1. Remove the one screw to release VK board from bezel.
2. Disassemble the two speaker lines from VK board.

Disassemble the speakers

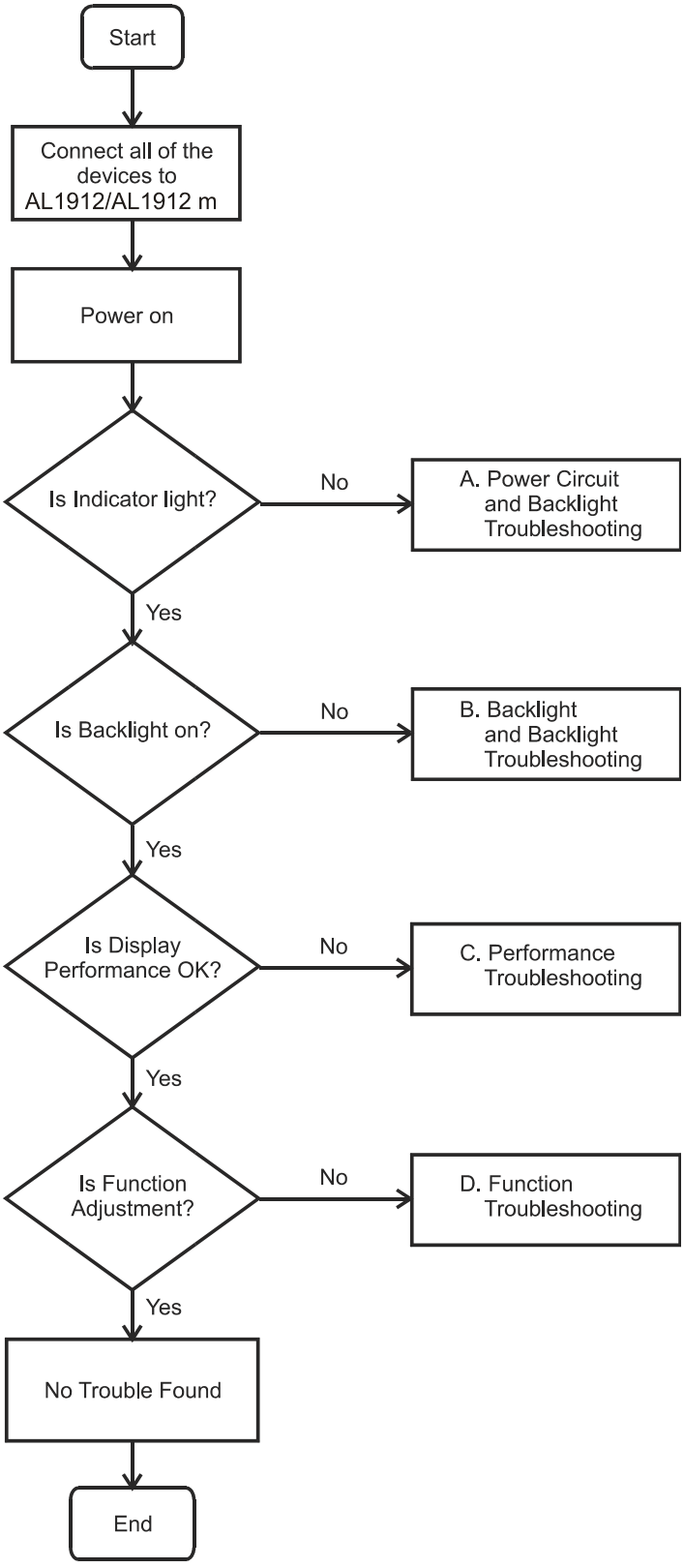
1. **Remove the two screws to release line and VK board from bezel.**
2. **Remove the two screws to release line and chassis from bezel.**
3. **Remove the four screws from bezel.**



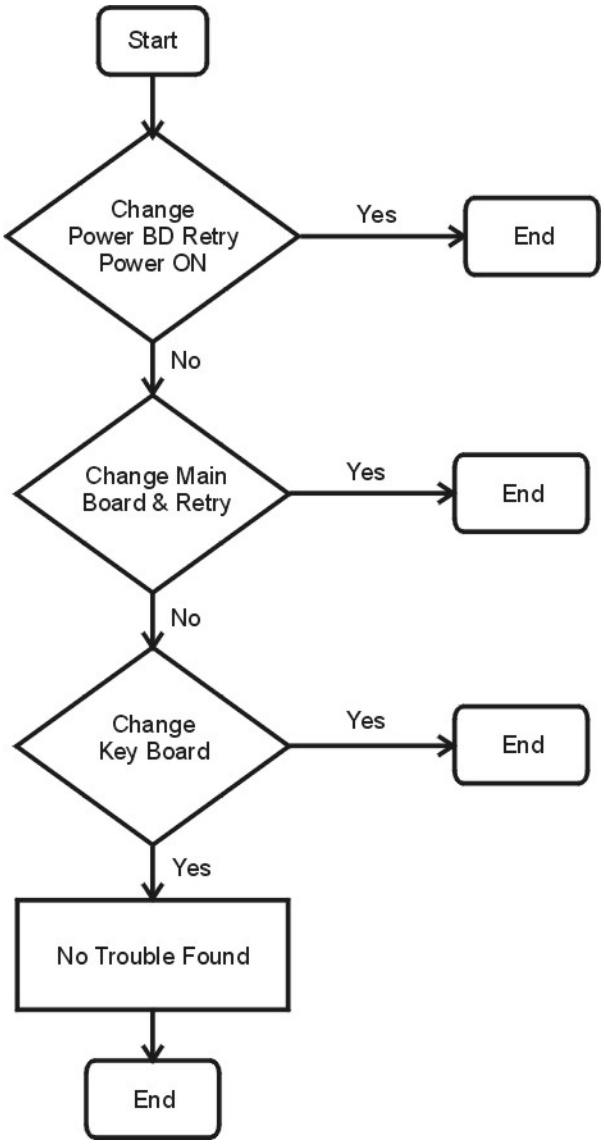
Chapter 4

Troubleshooting

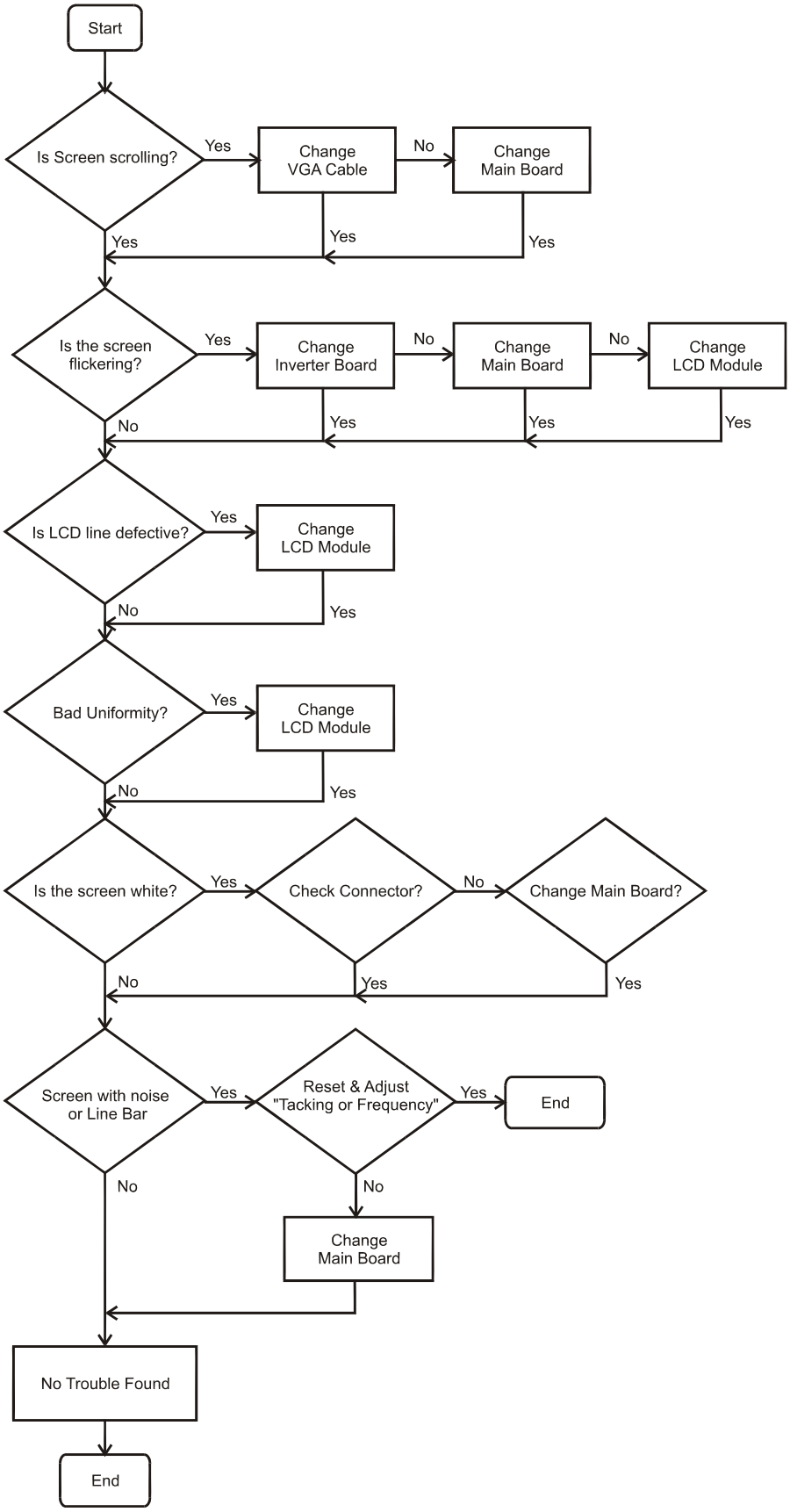
Main Procedure



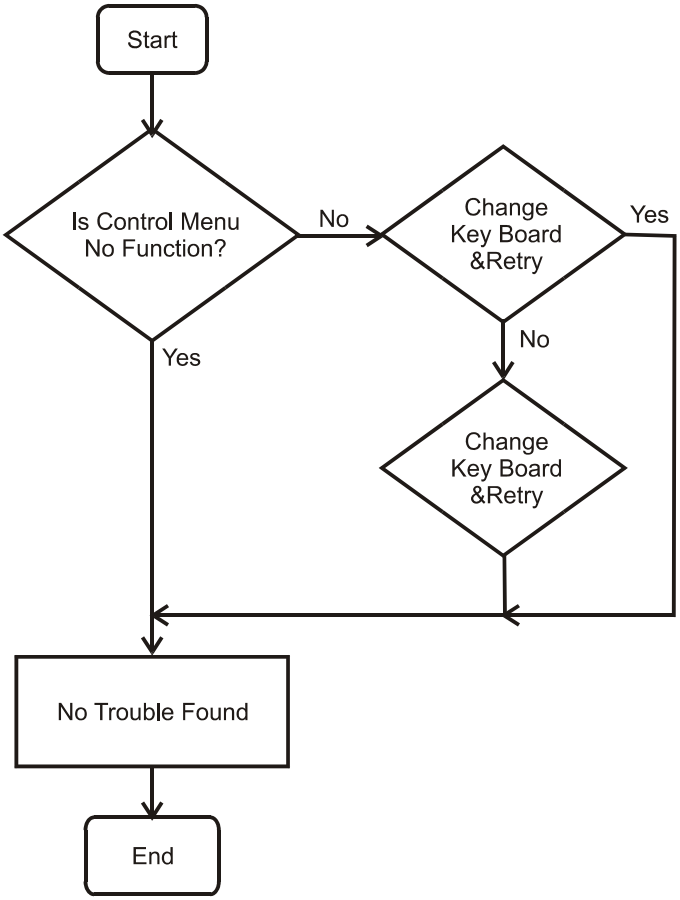
Power Circuit and Backlights Troubleshooting



Performance Troubleshooting



Function Troubleshooting



Chapter 5

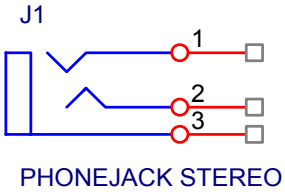
Connector Information

Phonejack stereo

PIN1. right : CEE22 typed connector

PIN2. Left

PIN3. Gnd : Line-in receptacle

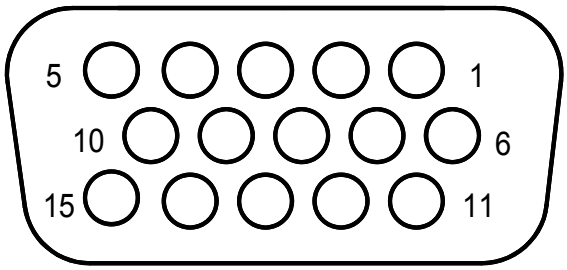


PHONEJACK STEREO

Video input Connector

Analog Video input Connector: 15pins mini D-Sub

Table 2.4.5. Pin assignment for D-sub connector



PIN NO.	Separate Sync
1	RED VIDEO
2	GREEN VIDEO
3	BLUE VIDEO
4	GROUND
5	GROUND
6	RED GROUND
7	GREEN GROUND
8	BLUE GROUND
9	PC5V (+5V DDC)
10	CABLE DETECTION
11	GROUND
12	SDA
13	H.SYNC
14	V.SYNC
15	SCL

Chapter 6

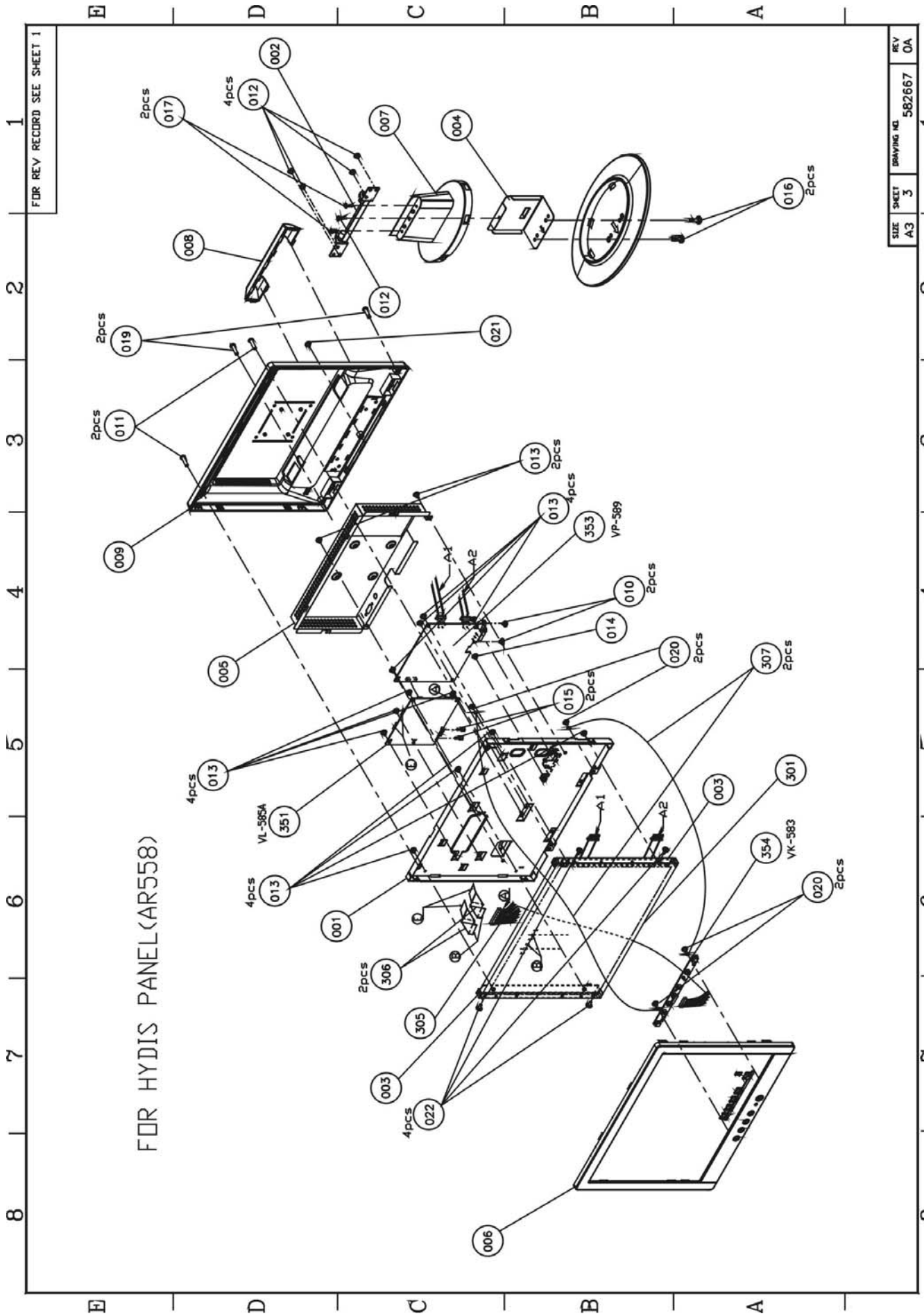
FRU (Field Replaceable Unit) list

This chapter gives you the FRU (Field Replaceable Unit) listing in global configurations of AL1515 m. Refer to this chapter whenever ordering for parts to repair or for RMA (Return Merchandise Authorization).

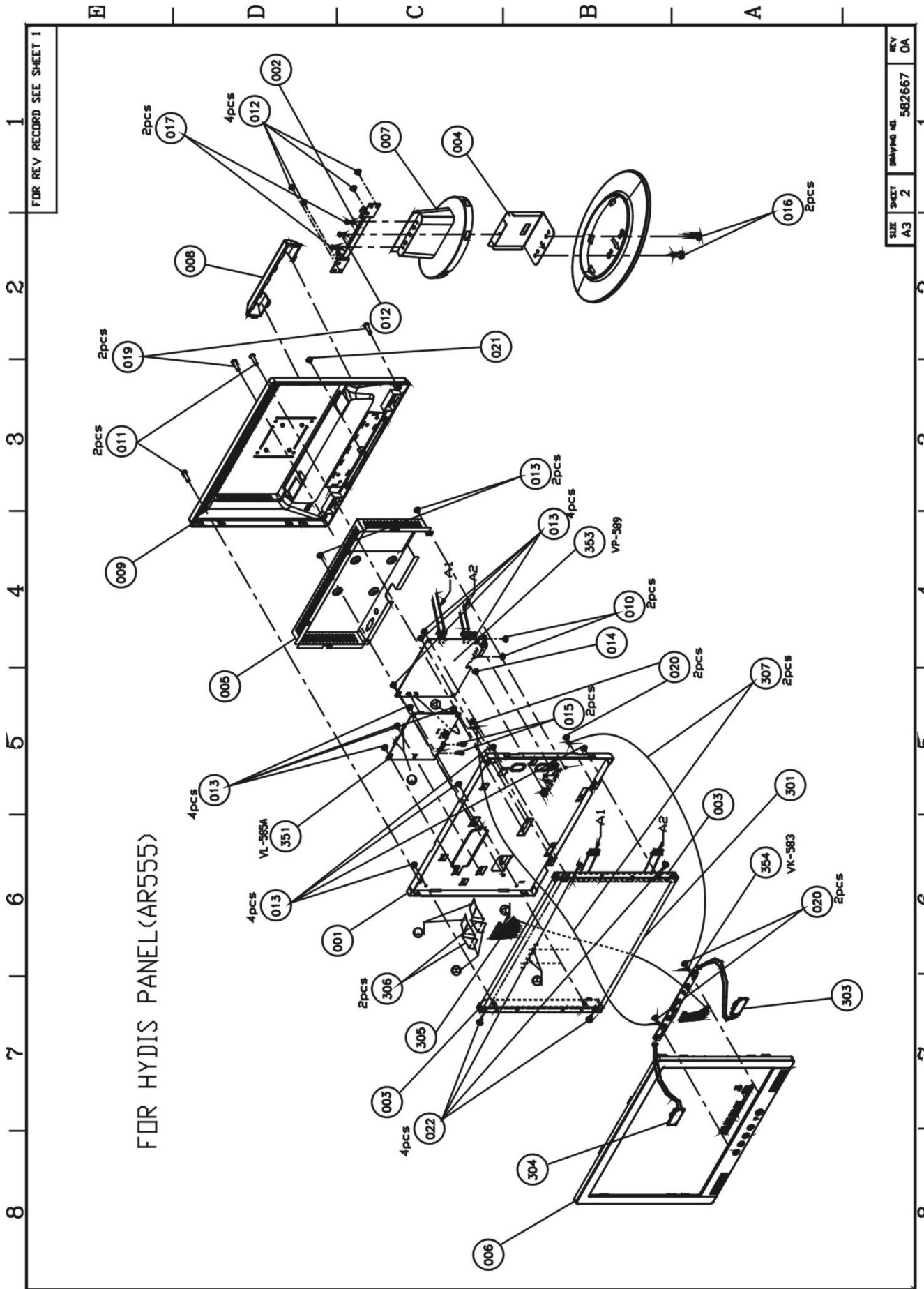
NOTE : Please note WHEN ORDERING FRU PARTS, that you should check the most up-to-date information available on your regional web or channel(http://aicsl.acer.com.tw/spl/). For whatever reasons a part number change is made, it will not be noted in the printed Service Guide. For ACER-AUTHORIZED CERVICE PROVIDERS, your Acer office may have a DIFFERENT part number code to those given in the FRU list of this printed Service Guide. You MUST use the local FRU list provided by your regional Acer office to order FRU parts repair and service of customer machines.

NOTE: To scrap or to return the defective parts, you should follow the local government ordinance or regulations on how best to dispose it, or follow the rules set by your regional Acer office on how to return it.

Model: AL1515

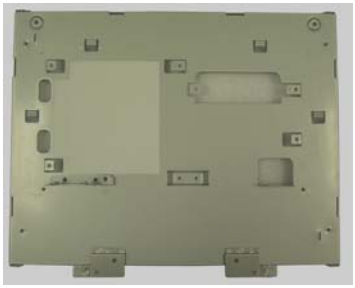


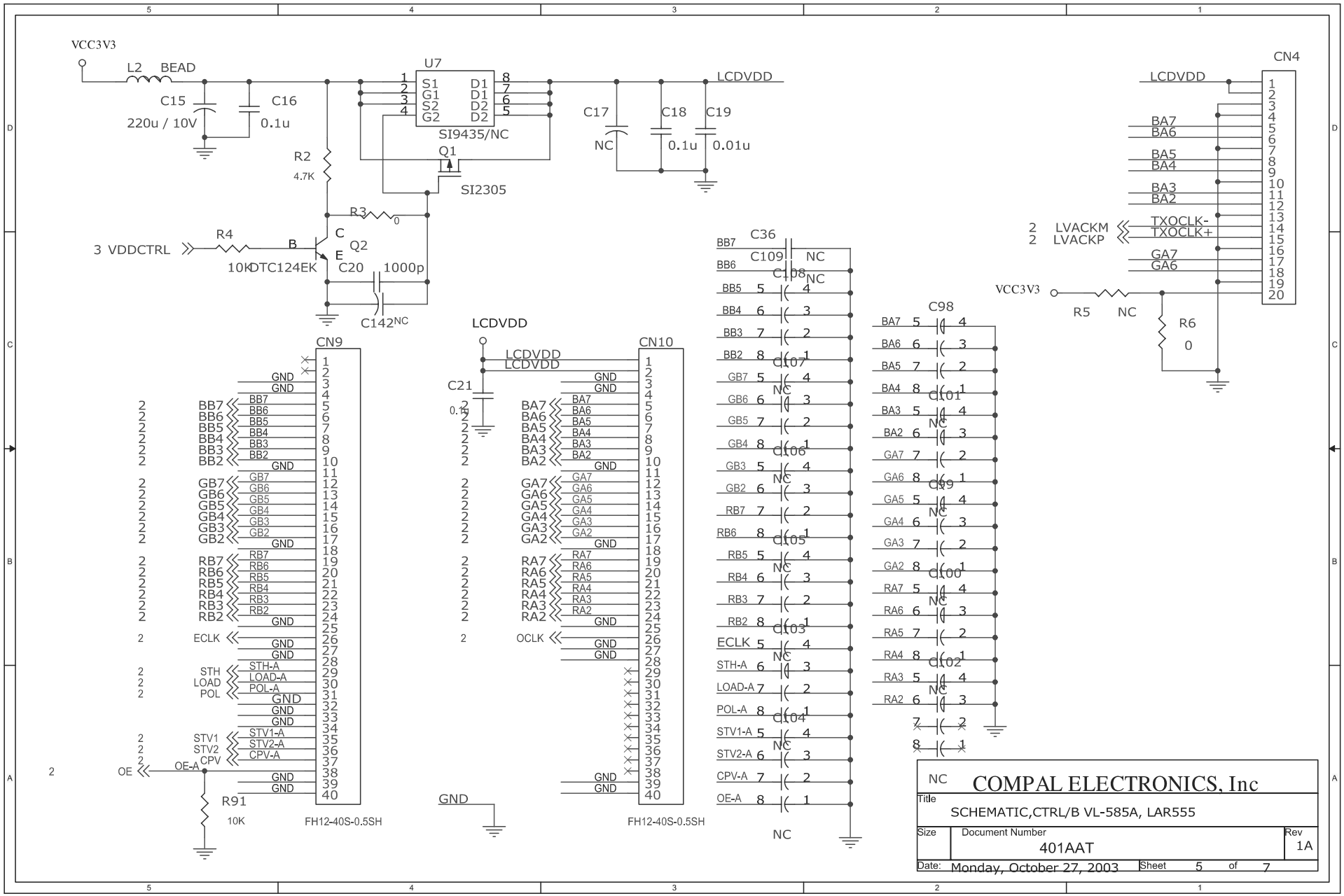
Model:AL1515 m

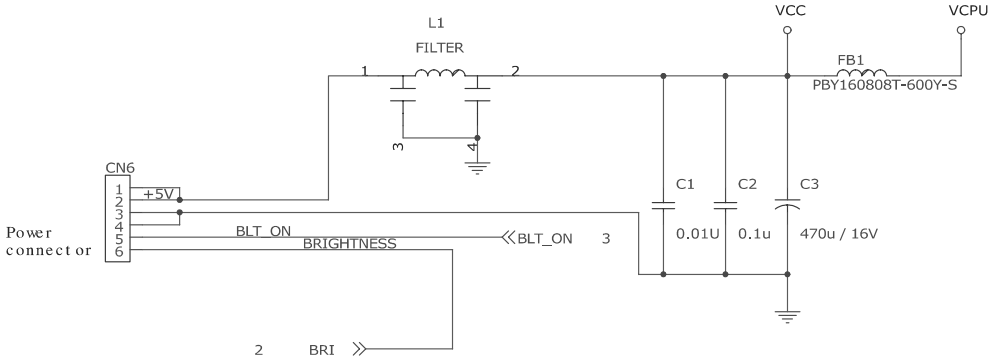


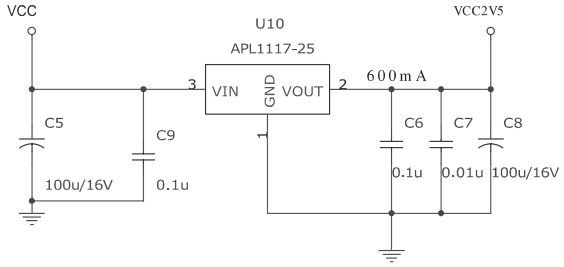
Part list

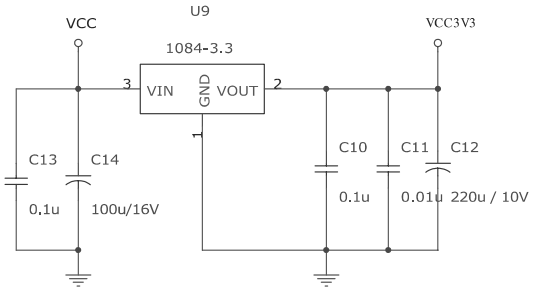
No.	Photo	Part Name	Vender Part No.
1		Hinge Cover	FAAR7721000
2		Base Assy	FAAR5517000
3		Rear Cover	FAAR551A000
4		Base	FAAR5518000
5		Neck	FAAR7713000
6		Main Shield	EEAR5512000

7		MB	451AAV30001
8		Inverter Board	453AAT30021
9		Front Bezel	FAAR5516000
10		Speaker-R	CG10021V930
11		Speaker-L	CG10021V930
12		Frame	ECAR5511000


VCC3V3
L2 BEAD
C15 220u / 10V
C16 0.1u
U7
SI9435/NC
R2 4.7K
Q1 SI2305
R3 0
R4 10K
3 VDDCTRL
Q2 DTC124EK
C20 1000p
C142 NC
LCDVDD
C17 NC
C18 0.1u
C19 0.01u
CN4
LVACKM
LVACKP
TXOCLK-
TXOCLK+
R5 NC
R6 0
CN9
FH12-40S-0.5SH
CN10
FH12-40S-0.5SH
C21 0.1u
C36 NC
C98 NC
C99 NC
C100 NC
C101 NC
C102 NC
C103 NC
C104 NC
C105 NC
C106 NC
C107 NC
C108 NC
C109 NC
R91 10K
OE
OE-A
GND
COMPAL ELECTRONICS, Inc
SCHEMATIC,CTRL/B VL-585A, LAR555
Document Number 401AAT
Rev 1A
Date: Monday, October 27, 2003
Sheet 5 of 7







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Size	Document Number: 401AAT	Rev: 1A
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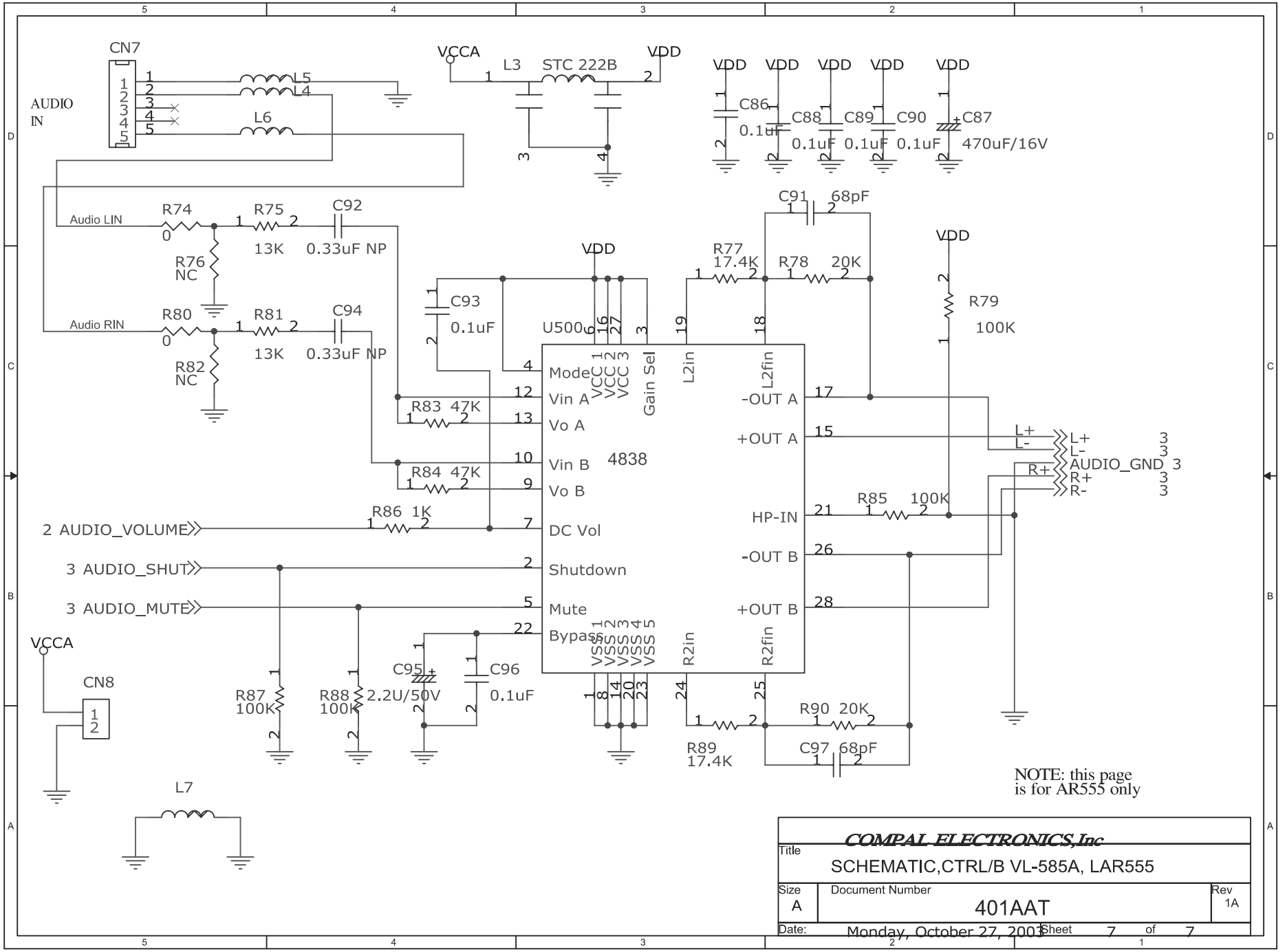

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Size: A	Document Number: 401AAT	Rev: 1A
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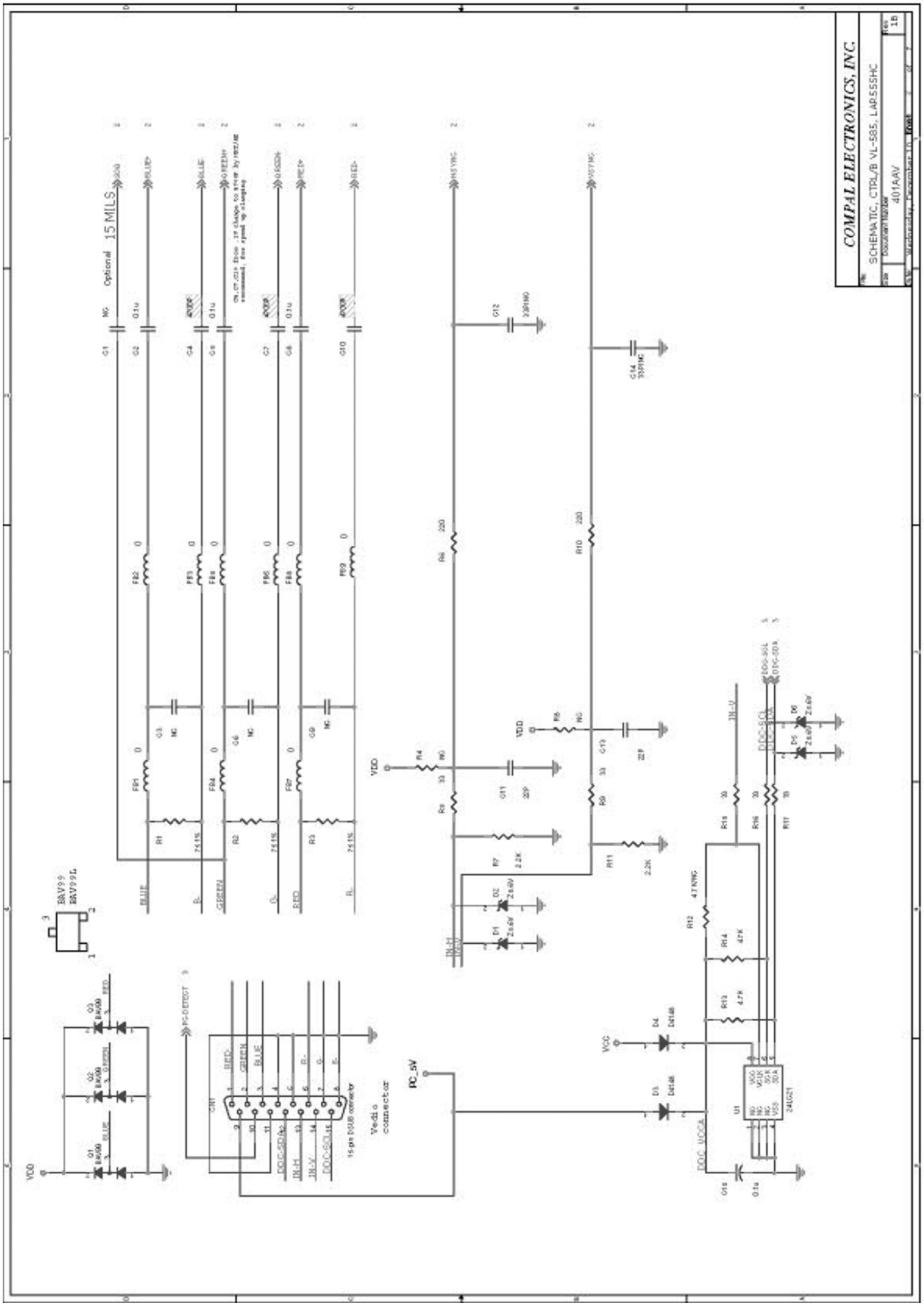
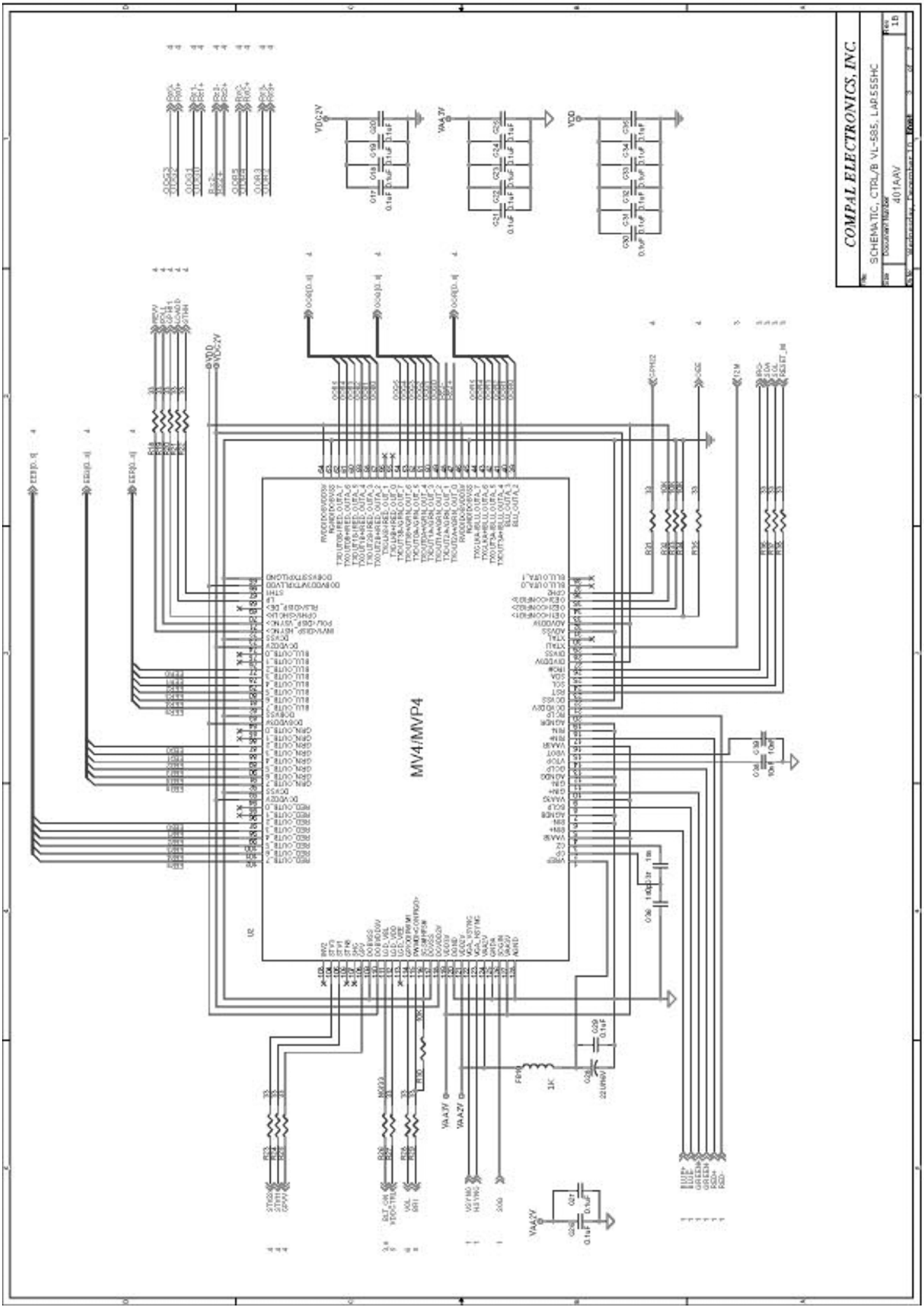
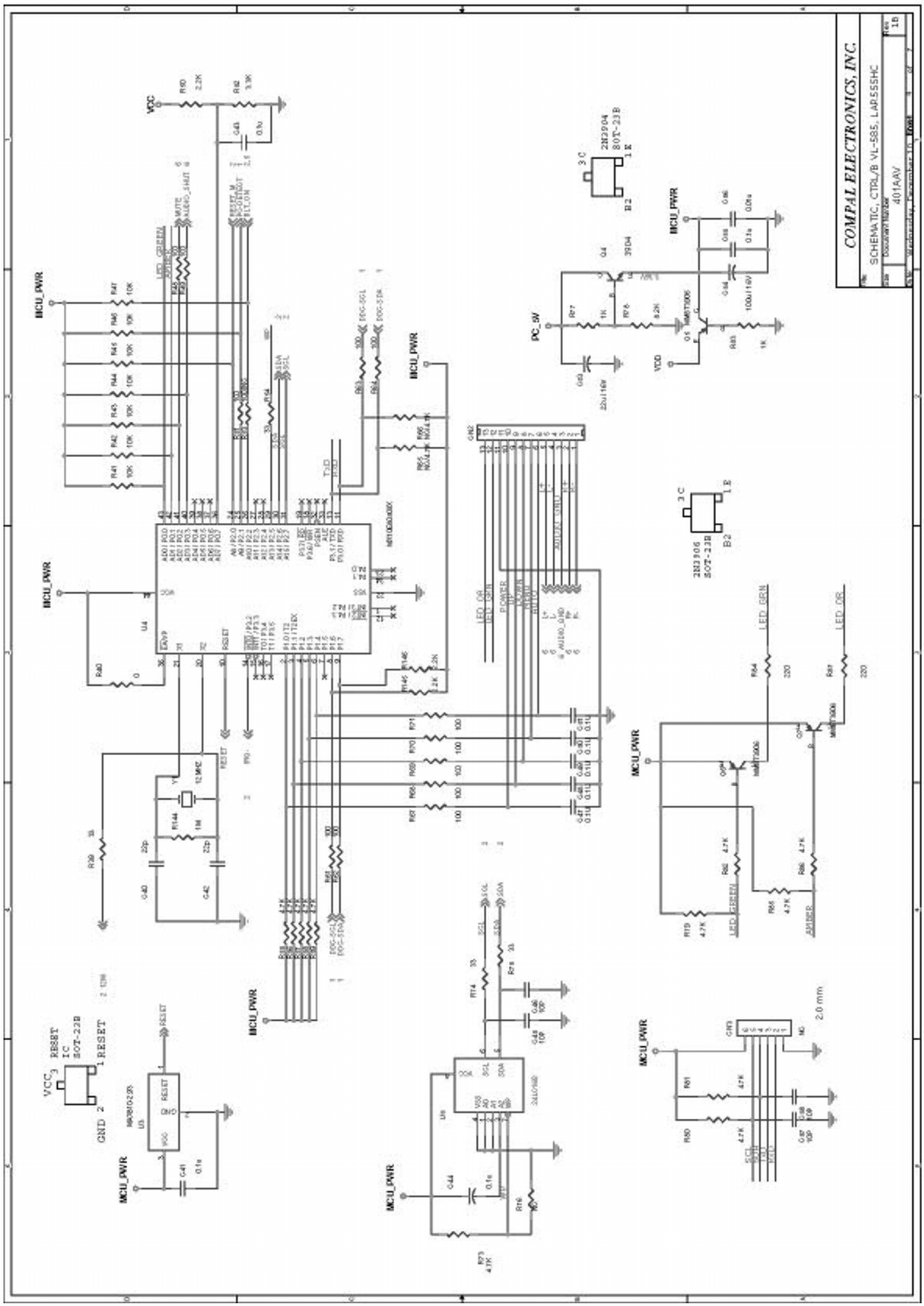
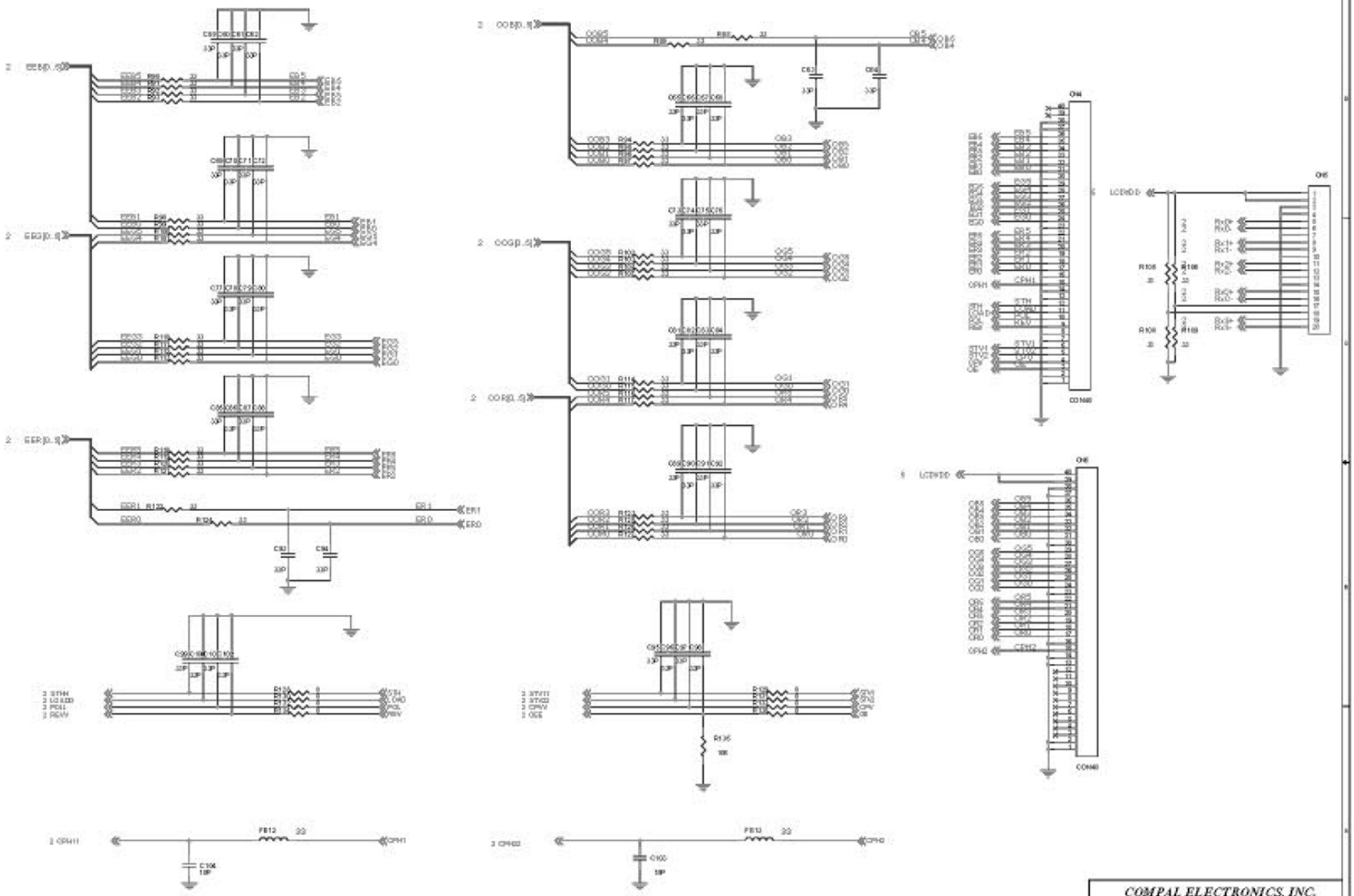

COMPAL ELECTRONICS, INC.
SCHEMATIC, CTPL/B VL-585, LAP55SHC
4011AAV
Optional 15 MILS
BAV99
BAV99G
15pin D-SUB connector
Video connector
PC_5V
VDD
VCC
DDC_VCCA
DDC-SCL
DDC-SDA
HSYNC
VSYNC
BLUE
GREEN
RED
240221


COMPAL ELECTRONICS, INC.
SCHEMATIC, CTRL/B VL-585, LAP555HC
401AAV
MV4/MVP4


COMPAL ELECTRONICS, INC.
SCHEMATIC, CTRL/B VL-585, LAP55SHC
401AAV
MCU_PWR
VCC
RESET
LED_GRN
LED_ORG
LED_AMBER
2.0 mm



COMPAL ELECTRONICS, INC.	
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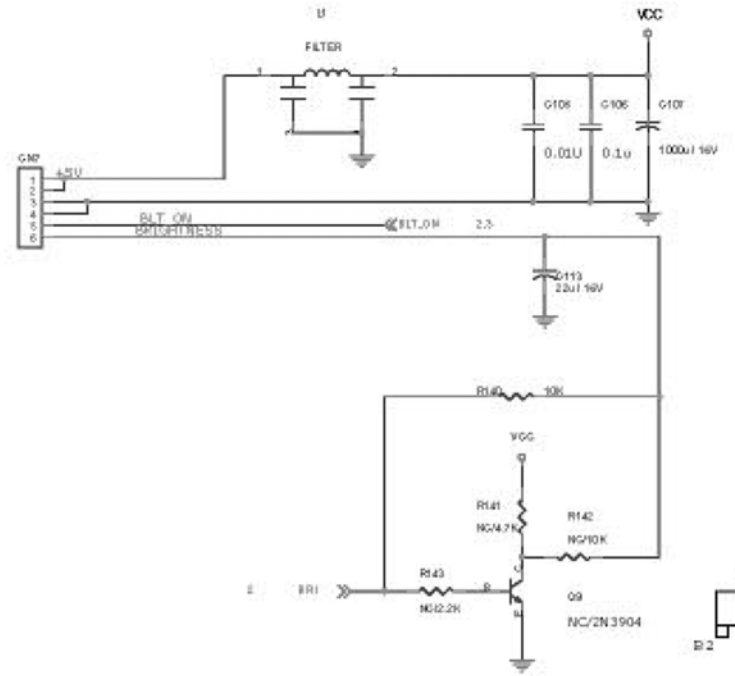

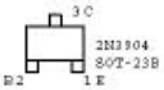

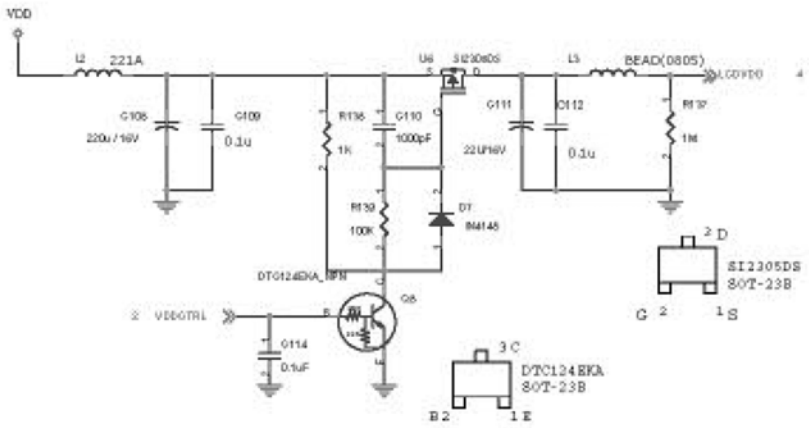

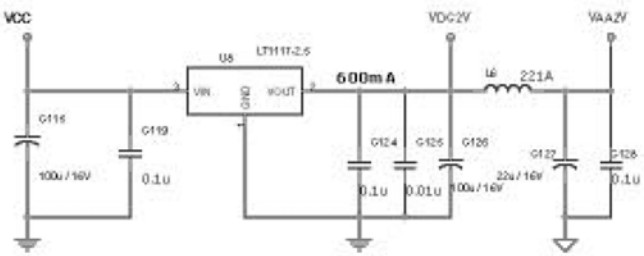

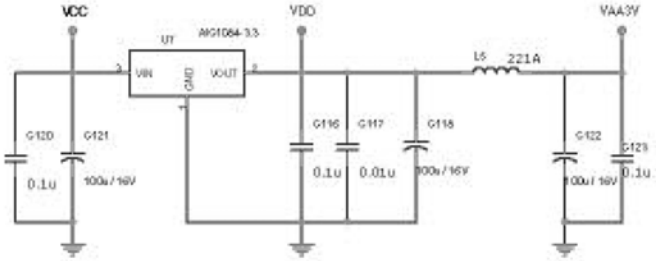

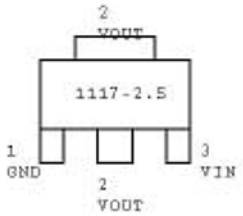

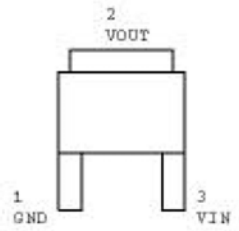

COMPAL ELECTRONICS, INC.		
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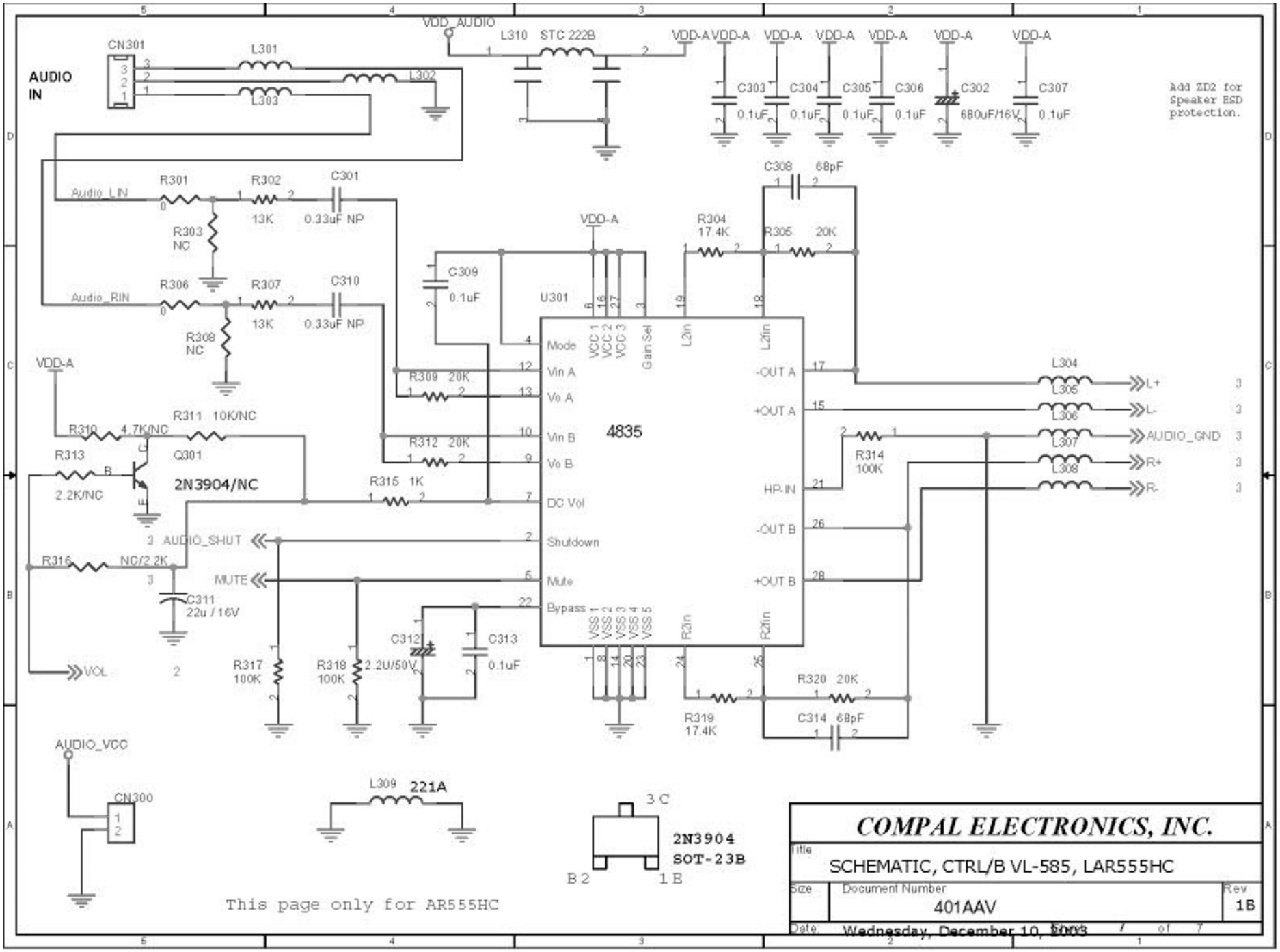
AUDIO IN
CN301
L301
L302
L303
VDD_AUDIO
L310 STC 222B
VDD-A
C303 0.1uF
C304 0.1uF
C305 0.1uF
C306 0.1uF
C302 680uF/16V
C307 0.1uF
Add ZD2 for Speaker ESD protection.
Audio_LIN
R301
R302 13K
C301 0.33uF NP
R303 NC
Audio_RIN
R306
R307 13K
C310 0.33uF NP
R308 NC
C308 68pF
R304 17.4K
R305 20K
C309 0.1uF
U301
4835
Mode
Vin A
Vo A
Vin B
Vo B
DC Vol
Shutdown
Mute
Bypass
Gain Sel
-OUT A
+OUT A
HP-IN
-OUT B
+OUT B
L304
L305
L306
L307
L308
L+
L-
AUDIO_GND
R+
R-
R309 20K
R310 4.7K/NC
R311 10K/NC
R312 20K
R313 2.2K/NC
Q301
2N3904/NC
R314 100K
R315 1K
AUDIO_SHUT
R316 NC/2.2K
MUTE
C311 22u / 16V
VOL
R317 100K
R318 100K
C312 2.2U/50V
C313 0.1uF
R319 17.4K
R320 20K
C314 68pF
AUDIO_VCC
CN300
L309 221A
2N3904
SOT-23B
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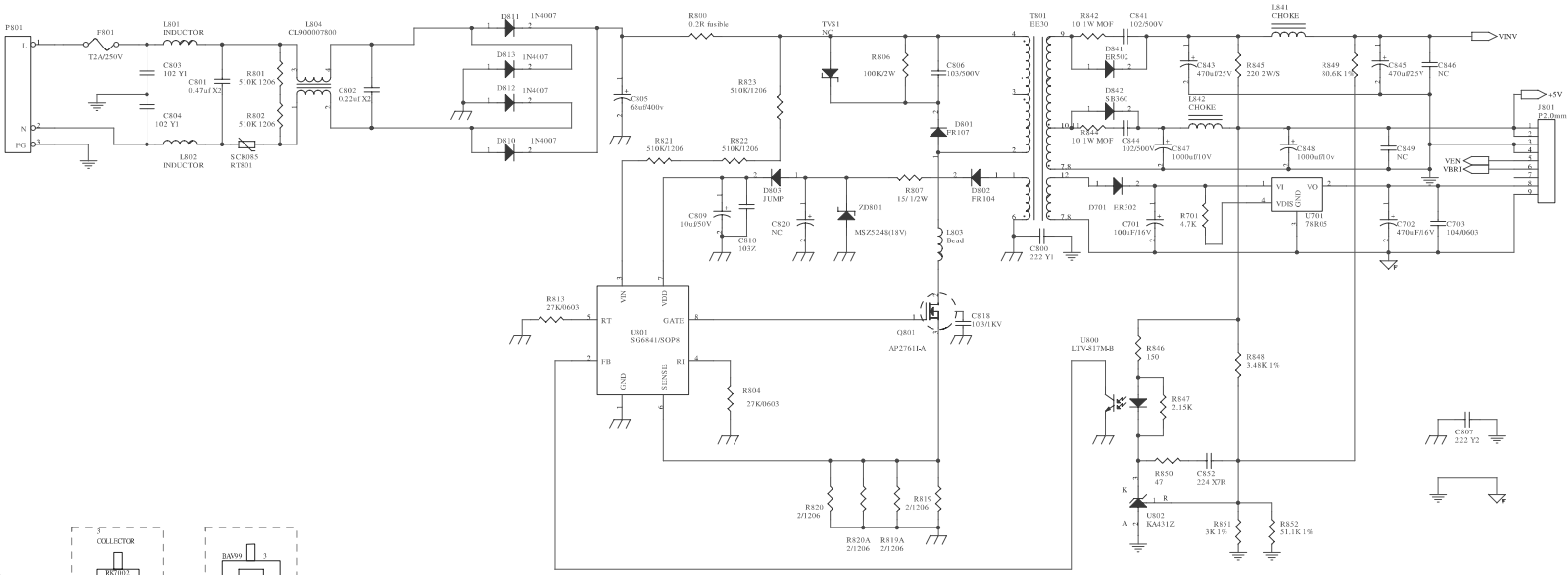
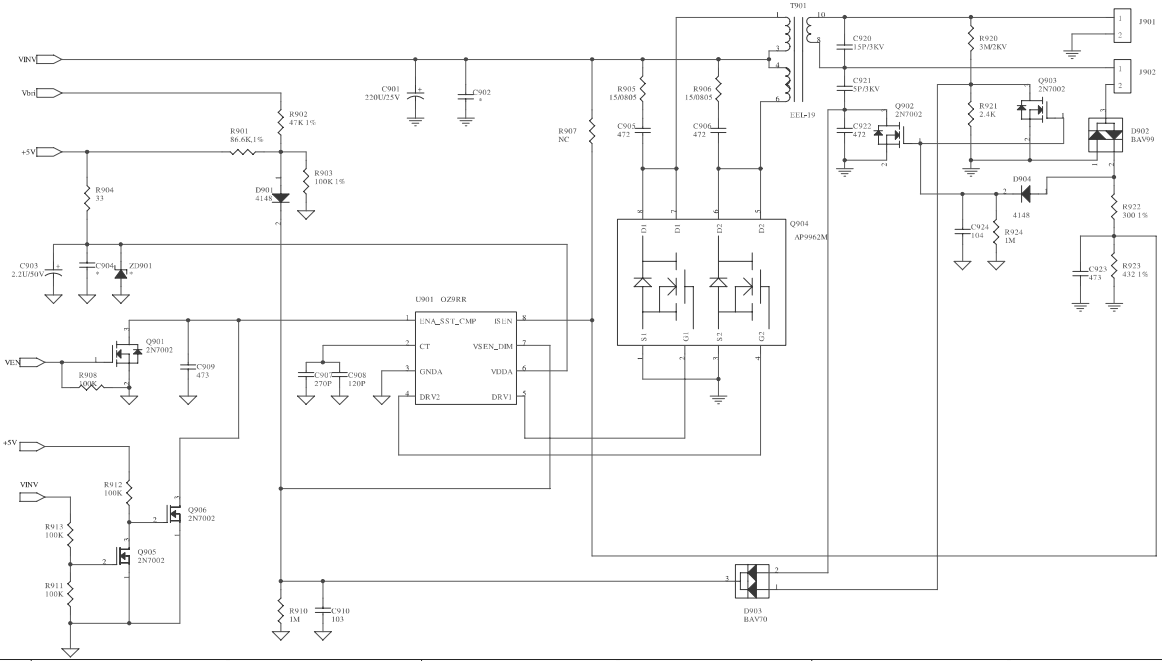
COMPAL ELECTRONICS, INC.
SCHEMATIC, CTRL/B VL-585, LAR555HC
Document Number
401AAV
Rev
1B
Wednesday, December 10, 2003





Panel	R922	R923	R901	R902	R903	C923
H Star - X84 3 - 7mA	300 ohm	432 ohm	86.6K	47K	100K	473
H Star - X87 4 - 9mA	300 ohm	332 ohm	86.6K	47K	100K	473
LG-P 3 - 9mA	300 ohm	332 ohm	86.6K	47K	100K	473

COMPAL ELECTRONICS, INC.		
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Size: A2	Document Number: 403AAT	Rev: 1B
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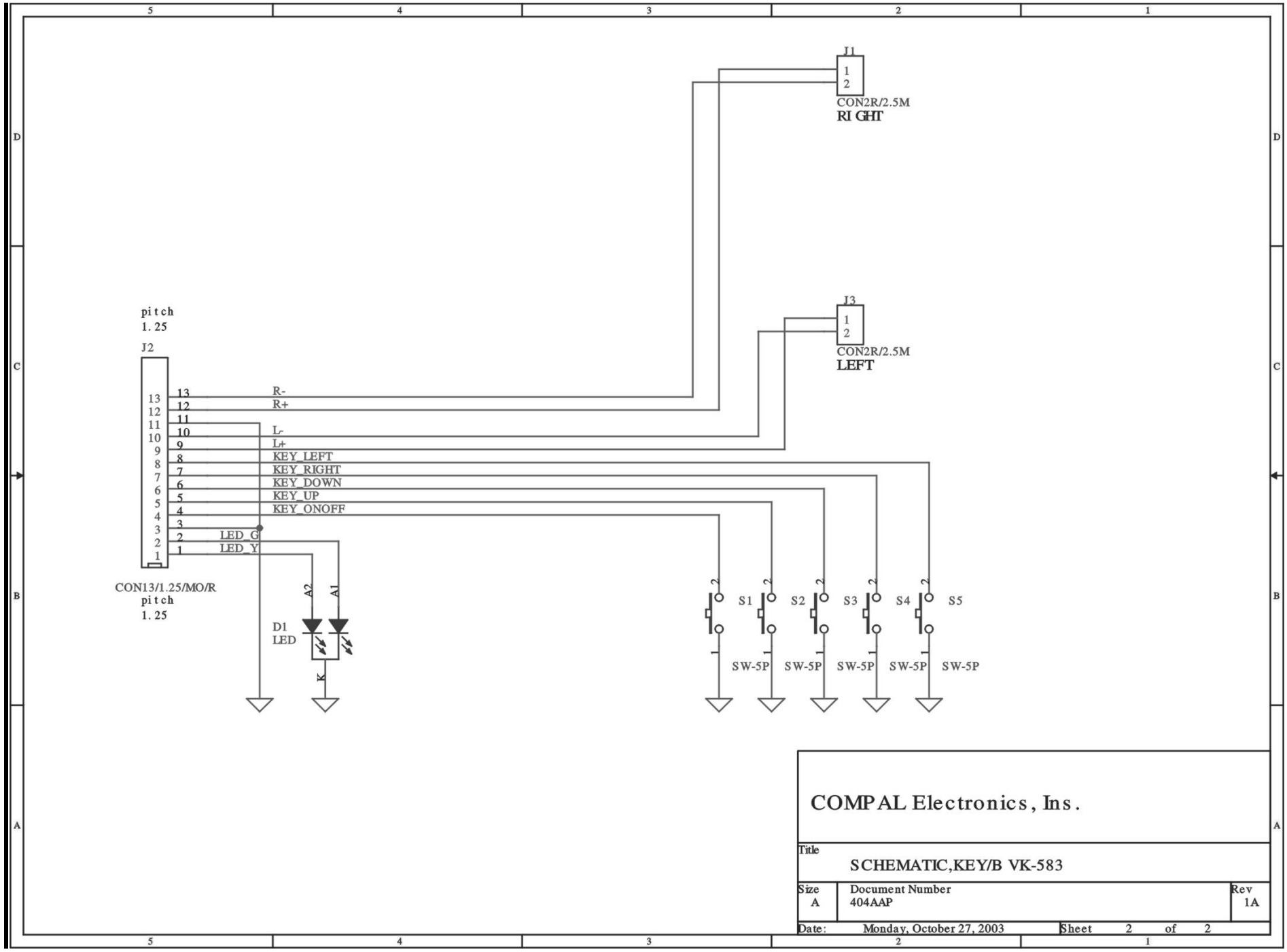
J1
1
2
CON2R/2.5M
RIGHT
J3
1
2
CON2R/2.5M
LEFT
pitch
1.25
J2
13
12
11
10
9
8
7
6
5
4
3
2
1
R-
R+
L-
L+
KEY_LEFT
KEY_RIGHT
KEY_DOWN
KEY_UP
KEY_ONOFF
LED_G
LED_Y
CON13/1.25/MO/R
pitch
1.25
A2
A1
D1
LED
K
S1
S2
S3
S4
S5
SW-5P
SW-5P
SW-5P
SW-5P
SW-5P
COMPAL Electronics, Ins.
Title
SCHEMATIC,KEY/B VK-583
Size
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Document Number
404AAP
Rev
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Date:
Monday, October 27, 2003
Sheet
2
of
2